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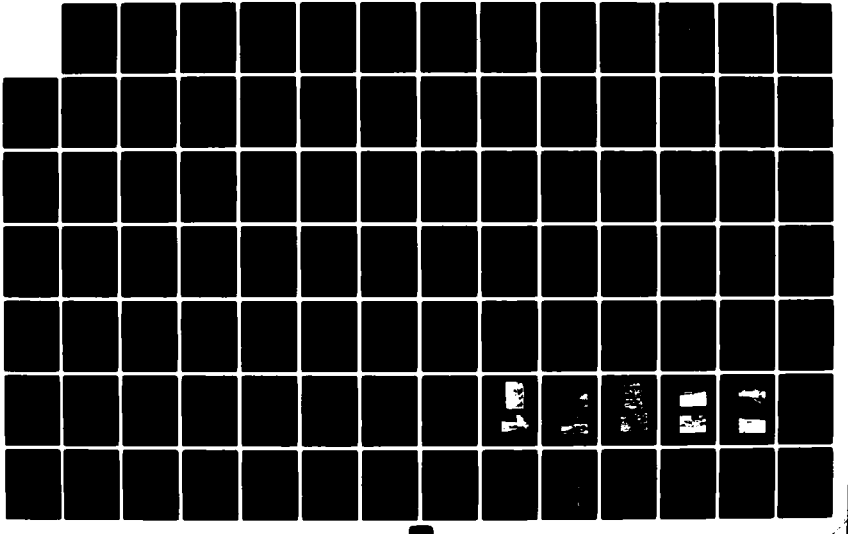

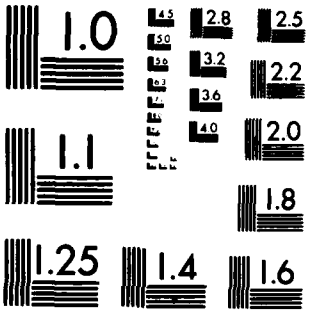

MERCED COUNTY STREAMS PROJECT
BURNS RESERVOIR, CALIFORNIA
INTENSIVE CULTURAL RESOURCES SURVEY

MERCED COUNTY STREAMS PROJECT
BURNS RESERVOIR, CALIFORNIA
INTENSIVE CULTURAL RESOURCES SURVEY

PERFORMED UNDER
CONTRACT #
DACW05-81-C-0097

by

PEAK & ASSOCIATES, INC.
8167 A Belvedere Ave.
Sacramento, California 95826

for

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 Capitol Mall
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ABSTRACT

Peak & Associates has undertaken a cultural resource study of Burns Reservoir. This project is part of the Corps of Engineers' Merced County Streams Project. The area to be impacted comprises 2,310 acres, including the gross pool of the proposed reservoir, as well as associated construction features. Seventeen resources were found and recorded, five of which had been recorded earlier. These included prehistoric middens, lithic scatters, and isolated bedrock mortar loci. The historic resources found were stone structures and walls. The richness and uniqueness of the resources, particularly the prehistoric, indicate that nomination to the National Register of Historic Places is appropriate for six of the resources. The alternatives for mitigation of adverse impact are predicated upon the status of the project, the projected impacts, and the nature of the resources. There are two kinds of impacts expected, inundation and destruction by construction operations. Preservation was emphasized as the best mitigation alternative; if not possible, then a two-phase testing measure program is proposed based upon the degree of expected impacts. The results of the survey were hampered by a lack of temporally diagnostic artifacts. The overall consensus of the data argues for a late manifestation in the Upper Emergent Period for all of the prehistoric resources found, but whether Miwok or Yokuts could not be established from the surficial evidence.

ACKNOWLEDGEMENTS

No large archeological project/report is the product of one individual. Rather it is a cooperative effort from many people at all stages of the project. In acknowledgement of this, we wish to thank not only the people who contributed with their direct involvement but all others who offered support and encouragement.

We are especially appreciative of the cooperation and assistance offered by the U.S. Army Corps of Engineers' personnel who helped in interpretation of plans and hydrologic data. Patti Johnson, District Archeologist, participated in field review and has provided us with positive critical review of the report during the various preparation stages.

There is no doubt that the field crew deserves a very large share of the credit as they were more than competent and meticulous in identifying and recording the complex cultural resources within this study area. It was a pleasure to have excellent comprehensive field notes and illustrations as the preparation of the report was made so much easier. Despite the extremely hot weather and the long daily walk to and from the work areas, the crew members maintained a high quality or work and retained their good humor. Our deepest thanks to our crew chiefs: Robert Gerry, Richard Kardash, Larry McKee, and Melinda Peak; and to the technicians: Barry Boyer, Herb Dallas, Hannah Gibbs, Stuart Guedon, Sherri Gust, Les Harville, Paul Neimoyer, Patricia Perkins, and William Slater.

The Native American Observer was John (Rusty) Brocchini from the American Indian Council of Mariposa County. Rusty was a great asset to the team, providing insight into Native American values and concerns and also participating in all phases of the field work. His most valuable contribution, in terms of the field work, was in making meticulous scaled drawings of the petroglyphs at the several loci. He also acted as liaison with the interested Native American community. We also appreciated the time and effort expended by the Indian people.

The excellent maps, historic feature illustrations and petroglyph replications are the product of Robert Gerry, Stuart Guedon and Rick Kardash, who expended hundreds of hours on them.

Jeanne Muñoz deserves a great deal of credit for acting as our coordinator with the Native American people and for compiling the historic overviews. She was ably assisted by the historic researcher, Melinda Peak.

Dr. L. K. Napton, California State College, Stanislaus, was more than cooperative in providing permanent trinomials for the cultural resources even though it was done with tight time constraints. His office insured a careful concordance for previously recorded sites and those identified during the 1981 field survey.

Jeffrey Miller made a special trip from Los Angeles to accompany us for one day on the Bear Creek Reservoir survey. He had a great deal of information on the location of many sites--expecially the rock art loci. We are very appreciative of his interest and help.

Perhaps one of the more important persons involved in the report compilation was our tireless office manager, Lori Lyford. She ran inuumerable errands, coordinated the work flow, and typed several drafts, all site survey forms, and two of the final reports. She has somehow retained her sense of humor throughout the months of work. Without her diligence, the final product could not have been achieved.

To our typists, Carol Larsen and Teresa Legatos, who produced three of the final reports, we give our deepest thanks.

Finally, we wish to thank the landowners who gave us information on access roads and on resources within their property. To all other persons who provided information, opened archives, and otherwise assisted, please accept our gratitude.

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INTRODUCTION

An intensive cultural resource survey was undertaken within the boundaries of the proposed Burns Reservoir. The work undertaken was part of the Merced County Streams Project (Map 1) which is a flood control project undertaken by the Corps of Engineers. The entire project would consist of the enlargement of Burns and Bear Dams, the construction of Haystack and Castle Dams, and downstream channel improvements. The purpose of the project is to temporarily store runoff behind ungated dams to prevent downstream flooding. There would be no permanent pools. The cultural resource survey was ordered in accordance with Executive Order 11593 and Public Law 93-921, which requires that all cultural resources which may be impacted by the project be located, inventoried, and evaluated for eligibility to the National Register of Historic Places. At the present time, the construction of the proposed Burns Reservoir has been deferred. The report will present a limited testing program for the resources within the proposed reservoir to provide the Corps of Engineers with the management data necessary to proceed in case the situation changes in the future.

As presently designed, the proposed Burns Reservoir will encompass 2179 acres, with a gross pool elevation of 322 feet. The total acreage involved--including the spillway area, the dike, the dam site, and the improvements to the access roads--will increase the total acreage involved to 2310 acres.

The project area (Burns Reservoir) has been partially surveyed twice before, once with positive results and latter negative. The negative findings were unacceptable since the presence of resources in the project area was a known factor.

The impacts will derive primarily from two sources: quarrying of construction materials, and inundation (wave action erosion). Other impacts due to inundation may have to be considered.

Evaluation of the significance of each resource was predicated upon its potential to address pertinent regional research questions. The assessment is based upon the surficial evidence, both artifactual and eco-factual. The limitations inherent in a cultural resource survey are recognized.

The mitigation alternatives proposed are based upon the nature of the resource, its information potential, and the nature of the impacts. The degree of impact to be expected from ungated flood control dams, in comparison to the more studied gated dams, is a question which has not been directly faced before to our knowledge, and our recommendations are predicated with this difference in mind.

The ethnohistoric and historic research has been undertaken by an ethnohistoric consultant and a historic researcher. The

ethnohistorian's duties consisted of establishing a liaison with concerned Native American groups, soliciting their knowledge concerning culturally important resources in the project area, conducting primary source archival research, and interviews both with the Native Americans and the later ethnic groups of the historic period, the settlement systems, notable personages, and subsequently incorporating this knowledge into a comprehensive report. The historic researcher helped in the archival research, and interviewing of consultants.

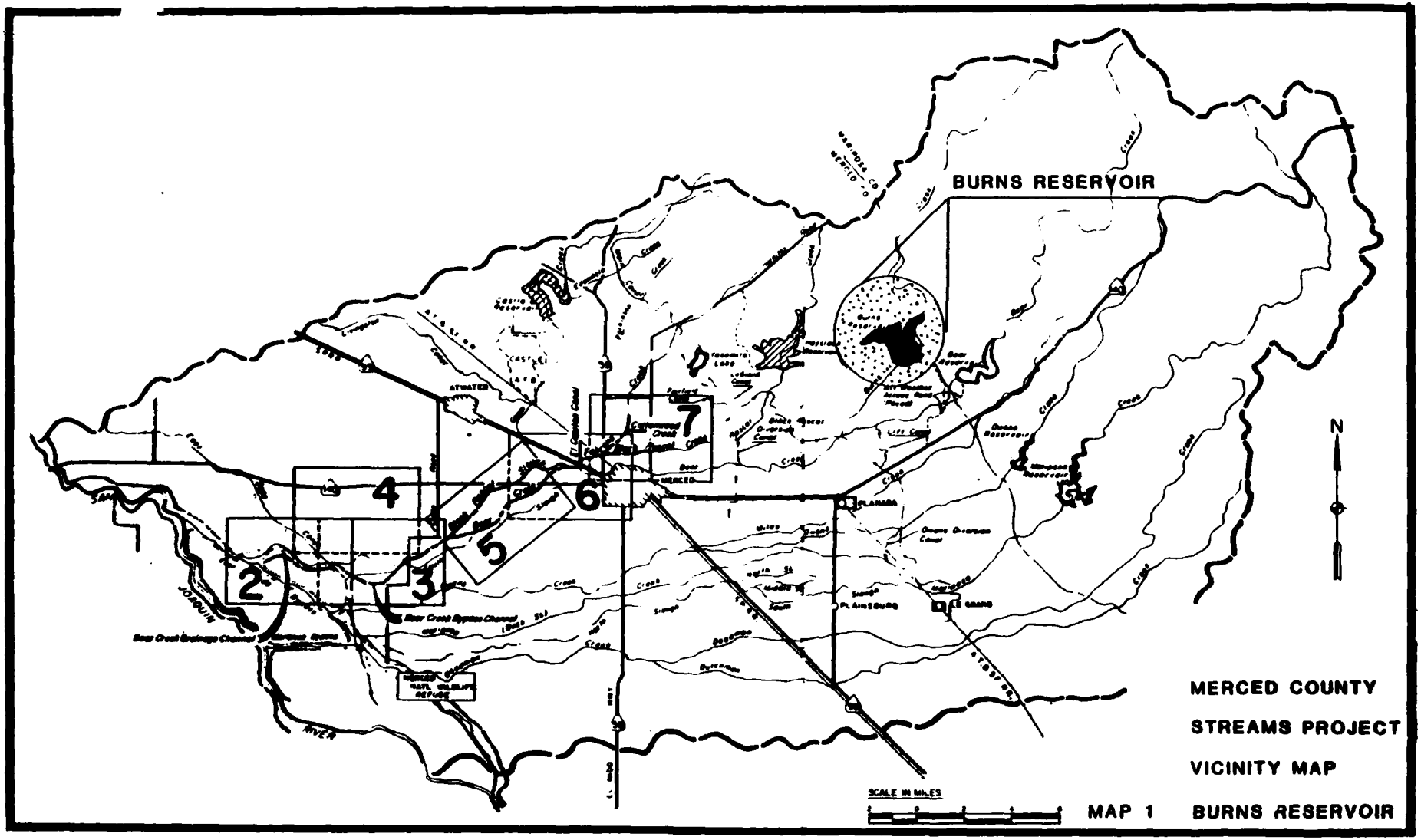
Prior to the fieldwork, the principal investigator and the ethnohistorian met with the American Indian Council of Mariposa County to determine if they knew of any Native Americans who had knowledge pertaining to the project area. They also suggested a number of Native Americans who would accept a position as an observer. The individual who accepted proved to be a valuable member of the crew, and he provided insights into the interrelationships of sites and features.

There were seventeen sites recorded during the cultural resource survey at Burns Reservoir. Fourteen were prehistoric sites, three were historic, and one had both a historic and a prehistoric component. There were four large middens, one of which was associated with over a hundred bedrock mortars. In addition, two petroglyph sites were recorded, one of which was previously found. The other prehistoric sites were isolated bedrock milling stations, small middens or lithic scatters. The historic sites consisted of collapsed structures, or foundations, stone fences and a graffiti location.

The summer aridity indicates occupation during the prehistoric period probably occurred during the wet seasons, winter and spring. The presence of two standing pools may indicate some limited summer occupation could have taken place, if the need warranted. The types of sites found suggests a settlement system with one large central village associated with a number of small villages as well as task specific locales.

The ethnographic inhabitants of the project area have not been established in the literature, and within the constraints of a cultural resource survey they could not be determined with the archeological evidence.

The historic sites appear to be associated with the ranching period which followed the initial mining operations. Unlike the present ranching economy in the region which is dominated by cattle, the earlier ranchers had a mixed economy of sheep and cattle.


BURNS RESERVOIR
N
MERCED COUNTY
STREAMS PROJECT
VICINITY MAP
SCALE IN MILES
MAP 1 BURNS RESERVOIR

SCOPE OF WORK

Purpose

In accordance with Executive Order 11593 and Public Law 93-291, all cultural sites which may be impacted by project construction will be located, inventoried and evaluated for possible nomination to the National Register of Historic Places. The purpose of this work is to intensively survey and inventory the cultural resources at the proposed Bear, Castle, Burns, and Haystack reservoirs, and downstream channel improvements Merced and Mariposa counties, evaluate all sites for National Register eligibility, and prepare a plan for possible mitigation and preservation actions.

Project Description

The project will consist of (1) two new detention dams (Castle, Haystack Mountain); (2) enlargement and modification of two existing detention dams (Burns, Bear); and (3) about 17 miles of levee and channel modifications.

As designed, the Bear Reservoir area will consist of approximately 836 acres to include the dam and spillway, reservoir pool, borrow areas and access roads. Castle Reservoir will consist of about 760 acres and include the dam and spillway, reservoir pool, borrow areas, access roads and dikes. Haystack Reservoir will consist approximately of 452 acres. The spillway, the bottom of the dam, and the access roads will increase the acreage to 510 acres. The renovation of the Burns Dam will increase the gross pool acreage to 2179 acres. The associated structures will increase the acreage to 2310 acres.

Research Design

The Contractor will be responsible for preparation of a research design. The Contracting Officer will review and approve the research design prior to its implementation.

The general overall research design in the Technical Proposal shall present the research needs or problem domains the contractor anticipates accomplishing under this solicitation. Contractors should include, as a minimum, information on the types and extent of study and analyses estimated to be necessary to fulfill these research needs. Archeological, historical, ethnohistorical, and architectual aspects must be addressed. The contractor's proposed overall research design will be organized

into separate sections for prehistoric archeology, historic archeology, and cultural anthropology. The accepted overall research design may be reviewed, revised and/or modified as necessary, during the conduct of the program.

Description of Report

Prepare five separate and complete, one for each reservoir and the downstream area, cultural resources intensive survey reports on the effects of the projects on archeological and historical at Bear, Castle, Burns, Haystack, and the downstream areas, by accomplishing the following:

Peak and Associates will review previous cultural investigations pertinent to the project area. The review should include a statement summarizing all known cultural sites, their locations if close to or within the project area, and findings from previous surveys, investigations, and ethnographic and historic background statements. Sources for the archival review shall be fully identified and shall include, but not be limited to, county records, the records of the State Historic Preservation Office; the California Archeological Sites Survey Regional Office, the National Register of Historic Places; the California Historical Landmarks; "Final Report on the Archeological Reconnaissance of the Merced County Streams Project, California"; and the report "Cultural Reconnaissance of El Capitan Canal, Black Rascal, Fahrens and Cottonwood Creek."

Local residents, personnel at public institutions, members of local historical societies and others who may have relevant cultural resources information shall be consulted. Such persons contacted shall be identified in the report in an appendix.

Consult with local Native Americans who may assist in identifying sites which they consider to be of religious or cultural importance. Identification of persons contacted and the type of information obtained shall be included in the report in an appendix.

Conduct an intensive on-the-ground survey of Bear Reservoir consisting of approximately 836 acres, of Castle Reservoir consisting of approximately 859 acres, of Haystack Reservoir consisting of approximately 510 acres, Burns consisting of 2310 acres, and the downstream channel improvements designed to locate, inventory, and evaluate for possible eligibility to the National Register of Historic Places all sites within those areas.

Prior to initiation of fieldwork, submit a survey plan for approval by the Government. The survey plan will identify intended survey methodology in detail for both historic and prehistoric sites.

Assess each located cultural site for National Register of Historic Places significance and eligibility. Determination of significance shall be defined in regards to National Register criteria, research potential and possible contributions to local, regional and National history and prehistory. The basis for evaluation shall be stated explicitly for each site. This information shall appear in tabular form also.

Prepare nominations using Form No. 10-360 for all historic and prehistoric sites which may be eligible for the National Register of Historic Places. These sites may be considered individually, as a district or any combination thereof. The level of documentation required for the nomination is outlined in the Federal Register; Vol. 43, No. 183, Wed. September 21, 1977.

Include a statement whether any, and which, sites of previously identified prehistoric or historic significance designated by Federal, State or local Government will be affected.

Provide for each located cultural resource scaled, detailed maps showing site composition, extent, presence of midden and artifact site features such as bedrock mortar outcrops, petroglyphs, historic structures, existing impacts to sites and the relationship of sites to nearby roads, trails, trees and other topographic features. Mapping shall be done with surveying instruments - such as metric tape and compass - and shall be of good quality. Details of other features such as bedrock mortars, petroglyphs, or historic structures shall be fully described and illustrated by photographs (with scale) and line drawings. Separate appropriate feature records for each shall be prepared. Sites previously mapped in the 1976 survey shall not be remapped; however, site records and maps shall be corrected in the event incorrect or additional information is found.

Provide fully completed site survey records for all cultural resources located and prepare a map showing all cultural resources in the project area.

At least three locations for each midden site shall be sampled so that midden depth, composition and other information useful in determining possible eligibility to the National Register of Historic Places can be defined. The location of these borings shall be shown on site maps. Findings shall be described in an appendix. Information pertinent to National Register evaluation shall be discussed in the main report in the section on "Evaluation of Significance for National Register of Historic Places."

Suggest protective and/or mitigative alternatives for each site. For each site identify the alternative which appears to be most feasible and discuss the basis for the decision.

Prepare time and cost estimates for accomplishing the mitigative and/or protective work. Sufficient detail shall be provided to enable Government review of labor efforts for field and laboratory work, possible special analyses, and other expenditures. The above information shall be provided for each site.

Surface artifactual materials discovered during the course of the survey will not be collected. Any culturally or temporally diagnostic artifacts which are: (a) seen in the field, but left at the cultural site, or (b) obtained from auger borings, etc., will be photographically recorded.

Identify those sites which should be test excavated (in addition to the 3 auger samples) in order to determine their significance. Suggest the amount of testing, in terms of 1 x 1 meter excavation units, and describe what variables were used to arrive at that quantity for each site. Prepare a cost estimate for such an effort.

BACKGROUND SECTION

Environmental Background

General Environmental Setting

Although one physiographic region, the San Joaquin Valley displays a diversified environmental pattern: arid foothills on the west, swampy valley floor, gently rolling eastern alluvial plains, and the oak parklands of the lower Sierra foothills. In terms of prehistoric land use, the restrictions or advantages of each area are reflected by the known settlement pattern.

Geologically, the Central Valley is a great geosynclinal trough which has existed from Tertiary times (Hinds 1952). Bounded on the east by the Sierra Nevada massif and on the east by the Coast Ranges, the trough follows a northwest-southeast axis reflecting the strike of the Sierra and Coast Ranges. The southern boundary of the valley is formed by the Tehachapi Range, while the Cascades and the Klamath Ranges rim the northern extent. The San Joaquin Valley is, in part, drained by the San Joaquin River, which flows west from the Sierra, bends sharply north at Mendota, and trends northwest to empty into the maze of sloughs and marshes of the Central Valley Delta into the Pacific Ocean. The southern end of the San Joaquin Valley is not drained by the San Joaquin River. The area extending from the Kings River to the base of the Tehachapis has no surface outlet under normal conditions of runoff and rainfall. Drainage is into a series of now extinct or controlled playas. The valley floor is a long alluvial plain gently uplifting to dissected fans derived from deposition by the degrading streams of the surrounding mountain ranges. Soils within the valley are generally devoid of natural rock constituents as the coarser materials tend to drop near the head of the fans, leaving the finer silts which carry further out into the valley.

The San Joaquin Valley lies in the rain shadow of the Coast Ranges, which effectively blocks much of the available moisture. Storms are diverted over the region to deposit their water content on the higher Sierra to the east. As a consequence, the area suffers from a deficient rainfall. The chronic pattern of aridity, apparently one of long standing, is marked on the west side, where few streams of perennial flow are established. Runoff from the infrequent storms is rapid and water disappears within a short period of time. In contrast, the east side, recipient of the captured rainfall and benefiting from stream flow headquartering in the large catchment basins of the upper Sierra ranges, contains numerous perennial rivers and streams. Erosion is more vigorous, a result of the high annual rainfall, and alluvial fans stretch westward out into the trough. The inequitable runoff has resulted in uneven deposition of sediments with the gradual movement of the axis of drainage far to the west.

The aridity of the west was reflected by the restricted vegetation growth. Arboreal communities were restricted to canyons of perennial streams, with sparse grass cover and some low-growing brush over the hill slopes and fans. The east side, with a correspondingly higher precipitation, had a different vegetative pattern. Oak groves, where adequate water was available, extended out onto the valley floor. Stream channels, sloughs, and lake shores were fringed by cottonwoods, willow, and sycamore. The stretches between stream courses, beyond the percolation limits of ground water, were open grasslands. The low-lying valley trough, with sluggish streams near to grade, supported vast tule marshes and ponds with dense arboreal stands along rivers and streams.

The faunal communities of each environmental zone had a wide range in both variety and number. Waterfowl, attracted by the large, open waterways, swarmed around the ponds and sloughs. Fish, shellfish, and turtles were abundant, while small mammals and larger game were plentiful in marshlands and on the open plains. In all, the San Joaquin Valley provided a rich resource base for the prehistoric population.

Project Specific Environmental Setting

The proposed Burns Reservoir project lies on the edge of the foothills of the Sierra Nevada and the valley floor, northeast of the city of Merced. The proposed enlargement of the present reservoir will range in elevation from 265' to 322'. Burns Creek, in the project area, is an intermittent stream, with most of its flow confined to the winter and spring seasons. In the upstream portions of its course within the project area (approximately a mile and a half), it flows through moderately steep but well-rounded low foothill terrain. The creek's upper drainage basin is near Hornitos, and from there it flows in a sinuous path south, approximately seven miles to the project area and three more to its junction with Bear Creek, just north of the town of Planada.

The bed of the creek in this upstream portion is wide, with alternate channels in some places. The wide bed present today may have resulted from the mining which occurred there in the gold rush period, as well as dredging in the 1930s. There are considerable tailings along most of the creekbed in this portion of it in the project area, but an examination of the Haystack Mtn. USGS quadrangle, 15' series, indicated there is considerably more extensive tailings upstream between Greaser and Toledo gulches.

A few dam-like elongated mounds are found along the side of the creek, but they appear to have resulted from hydraulic mining eating away the surrounding terrain. The remnant of an old road is present on the north bank on the upstream edge of the creek within the project area.

Burns Creek has cut through the Ione and Valley Springs formations in this portion of its course and exposed some "Mesozoic metamorphic and igneous rocks of the Sierra Nevada basement complex" (U.S. Army Corps of Engineers 1981:56). Outcrops of a tufaceous rock of the Valley Spring formation are also exposed in several places.

As the creek enters the flatter terrain of the valley floor, the bed becomes more narrow and it has incised its bed two or three meters in places. In summer, there are a few standing pools of water which have introduced fish in them, and they likely could have supported native fish in the past. Mining, while it occurred, was clearly not as intensive as upstream.

The surrounding topography on this western edge of the valley floor is a flattish plain dissected by Burns Creek and its subsidiary drainages. The surface of the pediment is very hummocky, and it fits well within the definition of "mima mound" relief" (Arkley 1962:27). This topography is caused by the differential erosion of the North Merced Gravels which forms a flattish capstone pediment over the underlying clays and sandstones of the Mehrten formation (U.S. Army Corps of Engineers 1981:56). The creek and its tributaries dissection of this pediment have created a low undulating plain. The differential erosion of the pediment amid the softer underlying sediments have formed several "haystack mountains," which are small, low hills capped by the horizontally bedded pediment (Arkley 1962: 28). The more prominent example is "Haystack Mountain," situated just west of the project area.

There are many vernal pools (cow wallows) on the surface of the pediment, since it is fairly flat and impedes the runoff and absorbtion of the rainfall. The vernal pools range in size from a few meters across to 20 meters and more. All reveal much trampling by cattle, and a few bulls were observed rolling in them during the survey. There are many cobbles in their bed, a not surprising result, since they are formed on the North Merced Gravels.

The dominant vegetation community in the project area is introduced grasses and tarweed. This community covers the hills and most of the valley floor in the project area. There are scattered blue oak trees on the hills along the creek and near probable spring sources. Cottonwood and willow trees are found along the creek, particularly in the upstream portion of its course. Along the creek banks in many places are patches or mats of Bermuda grass. Large patches of starthistle form an unwelcome component of the community near the present dam, at least from the viewpoint of the archeological team.

The west side of the Great Valley is covered by a perennial grassland, which differed from other prairies of the world (Western Ecological Services Company 1981:4) both in regard to the perennial species present and the large number of annuals. Bunch grass was the dominant grass type throughout the Great Valley. It was associated with many other species of grass, sedges, and flowering plants depending upon the local ecotone. The two important edaphic habitats within the grasslands are the alkaline flat community and the "hogwallow" or vernal pool community (Western Ecological Services Company 1981:23). The alkaline flat community covered large areas of the valley, and Moraga clearly describes how arid it is during the late summer when his expedition passed through the project area in 1804 (Cook 1960:284). The vernal pool community is present on the east side of the valley wherever grasslands are underlain by hardpan, which creates pools in the winter. These pools are characterized by an unusual ecotype where a vernal flora has evolved.

Archeological Background

The project area encompassed by the proposed Burns Reservoir was originally surveyed by Mohr (1951) as part of the River Basin surveys. Mohr found six sites in the project area. All but CA-Mer-52, a petroglyph site, are either middens or lithic scatters.

Clewlow (1976) resurveyed part of the project area as part of the Merced County Streams Project. He surveyed approximately 18.5% of the area, mainly along Burns Creek and its tributaries. He was unable to find any of Mohr's earlier recorded sites and assumed they had been destroyed (Clewlow 1976:19).

The establishment of a chronological framework is a necessary step in which to discuss the cultural events evident from the analysis of the archeological record and other sources. Fredrickson (1973:114), as part of his dissertation research on the Coast Ranges, proposed a new chronological scheme for the prehistoric settlement of California. While the majority of his results are not directly applicable to the Sierran foothills province, his revision of the terminology for major temporal units is useful. The previous temporal concept used in California prehistory is the Horizon (see Fenenga 1977). It has proved

useful over the years to categorize the various archeological entities uncovered, but it does suffer from a few disadvantages. The primary fault of the concept is its blending of time units with archeological entities--e.g., the Windmiller facies has served both as a time period and as a Delta-based archeological entity (the Early Horizon).

Fredrickson (1973:116) has simply separated these two levels of conceptual categories (i.e., time and archeological entities). Of immediate import to the present report are his temporal units called "periods." The dating of them will probably need revision from time to time, probably by region, since cultural developments may proceed in a mosaic fashion. His periods are named for the dominant stage, the socioeconomic level of development. This does not imply that all archeological entities found within one period will be characterized by the same level of socioeconomic development. The periods recognized are the Early Lithic; the Paleo-Indian; the Archaic, which is divided into two sub-periods (Lower and Upper); and the Emergent, also divided into two sub-periods. Their correspondence with the older cultural chronology can be seen in Figure 1.

Figure 1: Cultural Chronology

Periods	Archeological Entities	Age
Upper Emergent	Phase 2, Late Horizon	A.D. 1500 - A.D. 1750
Lower Emergent	Phase 1, Late Horizon	A.D. 300 - A.D. 1500
Upper Archaic	Middle Horizon	
	Intermediate cultures	2000 B.C. - A.D. 300
Lower Archaic	Early Horizon	6000 B.C. - 2000
	Early San Francisco Bay	
	Early Milling Stone Culture	
Paleo-Indian		10,000 B.C.+
Early Lithic		

This section describing our adoption of Fredrickson's chronological scheme was deemed necessary since the previous chronology is still in use (Fenenga 1977).

The previous work in the project vicinity has consisted of cultural resource surveys and none have produced any temporally diagnostic artifacts. The assessment of the archeological resources still lacks accurate dating. It is believed that most represent the Upper Emergent, or the archeological manifestations of the ethnographic peoples who inhabited the area at the time of contact.

The archeological patterns characteristic of this region have not as yet been adequately defined. The archeological investigations at nearby Hidden Dam (Lake Hensley) could form the basis if the data were adequately studied and published. Bennyhoff's (1956) chronology for Yosemite is not considered applicable in this situation where the project area is located on the edge of the foothills and valley floor, since the settlement pattern and site types can be expected to vary.

The most appropriate available study is on Buchanan Reservoir in Madera and Mariposa counties (Moratto 1972) and it still provides the basic comparative data for other investigations in the portion of the Sierran foothills bordering the San Joaquin Valley. The Madera Phase of Moratto's scheme is in the Upper Emergent culture or pattern of concern here. It has been described many times in the literature and need not be summarized again here.

The Lower Emergent would be represented at Buchanan by the Raymond Phase, and the Upper Archaic by the Chowchilla Phase. These two have been well defined by Moratto and the interested reader is referred to his dissertation. There were no Lower Archaic entities found at Buchanan by his investigations. Later investigations by Peak (1976) recovered temporally diagnostic forms which indicate occupation occurred during most, if not all, of the Archaic Period. Certainly, Fenenga (1977:35) suggests that occupation at the Hidden Dam project area encompasses the Archaic, although the extent is not clear.

The Paleo-Indian Period does not seem to have been found in the sites of the lower Sierran foothills, but it has been identified at higher elevations, for example at New Melones Lake project in Calaveras and Tuolumne Counties (Crew 1980). The project area may have been occupied during this period, although the evidence will be difficult to find and may necessitate excavation.

The archeological evidence for earlier periods is more rare. (Peak 1981) has recently reported on a lithic industry from the lower foothills near Sacramento which typologically, and perhaps geologically, will have to be regarded as Paleo-Indian or earlier. Such manifestations were probably not relegated to one region, and similar early resources may be present but buried in the project area.

Ethnographic Background

The area in the foothills east of Burns Reservoir has generally been assigned to the Southern Sierra Miwok (Barrett 1908; Bennyhoff 1961; Kroeber 1925; Levy 1978). Regardless of cultural affinities at the time of white contact, the subsistence base and material culture were markedly similar throughout the foothill region. Neighboring Indian groups within the same

physiographic regions, although perhaps of different linguistic families, held more traits in common than with linguistically related stock in dissimilar zones (Map 2).

Eastern Miwok territorial boundaries are given as the Cosumnes River to the north, the Fresno River to the south, east to the Sierra Nevada crest, and west to the eastern edge of the Great Valley plains, with an extension onto the plains north of the Calaveras River (Levy 1978). Their area comprised the whole or part of the present political units of Sacramento, Amador, Calaveras, San Joaquin, Stanislaus, Tuolumne, Mariposa, Merced, and Madera counties. The greater part of seven large river drainages is covered by the unit: the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, and Fresno.

Three major physiographic units are spanned by the Miwok occupation: the high Sierran ranges on the east, the foothills, and a section of the San Joaquin Valley on the west. Climatic variation is extreme, consistent with the changes in physiographic setting.

The severity of winter in the upper elevations of the Sierra Nevada supposedly precluded permanent villages, with aboriginal use of these high areas restricted to summer and fall. Temporary camps within the mountain ranges permitted seasonal exploitation of this rich resource area, with the population returning to the foothill zone below 4,000 feet, where a more moderate winter climate prevailed (Barrett and Gifford 1933).

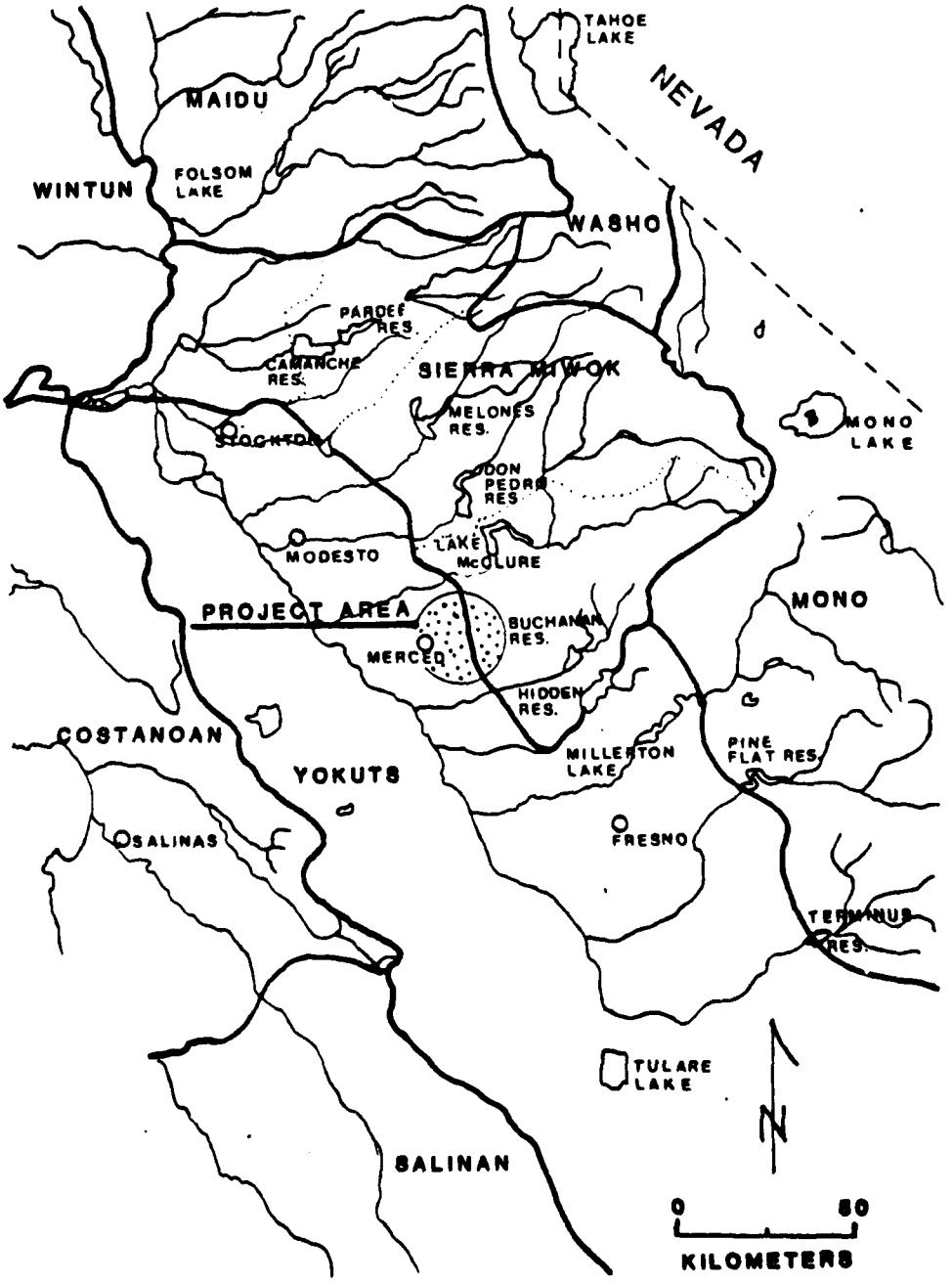
Settlement was predicated upon topographic variables as well as on cultural selectivity. Canyons are often steep, with few flat lands where villages could be located. As a result, most villages were situated on ridges or terraces above the streams. Available fresh water was a limiting factor to location, although small campsites, established for special purposes, are found with no nearby water source.

Subsistence was based on the acorn and supplemented by gathering of seeds, berries, greens, nuts, and edible roots. Fish, game, and small mammals augmented the diet. Processing of acorns required use of mortar and pestle to reduce the nutmeats to meal. Bread and mush were made from the leached meal.

The archeological manifestations of the Miwok are without doubt, the Mariposa Phase in the Yosemite Valley (Bennyhoff 1956), the Late Phase in the Sonora region with Desert Side-notched points (Moratto and Riley 1976; Science Applications, Inc. 1979; Peak 1973), and, perhaps, the Madera Phase along the Chowchilla River (Moratto 1972) although others would disagree about the latter (Peak 1976).

There is a possibility that the region was occupied by the Northern Valley Yokuts. Clewlow (1976) has recently adequately

DRAINAGES AND ETHNOGRAPHIC TERRITORIES OF THE PROJECT VICINITY



Base map adapted from Moratto 1972, Map II.

MAP 2

summed up the meager knowledge about them and the reader is referred to this review for further details. Wallace's (1978) excellent summary is the best general recent review. Clewlow does not mention that their villages were situated on high zones or hills above nearby watercourses (Wallace 1978), but such small rises are apparent on the project map for Burns Reservoir and will have to be thoroughly examined.

Clewlow does note the problem of distinguishing between Yokuts and Miwok archeologically, but Bennyhoff's Stockton District may be applicable for the Yokuts if some differences between the more northerly placed Yokuts are acknowledged. Perhaps a more appropriate "pattern" would be the Panoche Complex (Pritchard 1966; Olsen and Payen 1969) from the west side of the San Joaquin. Little evidence exists of its hallmark trait, the Panoche Point, on the east side of the valley across the San Joaquin River. It was not present along the Chowchilla (Moratto 1972) or in any of the other complexes of foothill sites investigated in the recent past (Peak, 1976, would disagree). Perhaps the pattern which typifies this portion of the San Joaquin Valley has yet to be determined for the protohistoric or Late Emergent Period.

Linguistic Prehistory

Moratto and Riley (1980) presented a hypothetical model of California linguistic prehistory in their research at Balsam Meadow in the Sierra National Forest. The points of the model which need to be emphasized in this study are: (1) California was inhabited primarily by Hokan speakers between 10,000 and 6000 B.C. The Western Pluvial Lake Tradition (Bedwell 1973) would represent these ancient Hokan populations. (2) Between 2500 and 1000 B.C., there was a movement of Yokutsan groups into the valley and Sierran foothills from the Delta. The Windmiller Pattern and the Crane Flat in the Sierra are seen by Moratto to represent this expansion. Pacheco A and B (Olsen and Payen 1969), on the west side of the San Joaquin Valley, may represent another part of this expansion. They will also be present in the foothills by 0 A.D./B.C. as far south as the Fresno River. Moratto sees this later movement as the Chowchilla Phase. (3) The eastern Miwok (Levy 1978), including the Plains Miwok, diverged from the Coastal Miwok around the time of Christ. The Sierra Miwok quickly moved south, displacing the earlier Yokuts groups (Moratto's Madera Phase and perhaps the Late Raymond). In Yosemite, the Mariposa Phases represent the Miwok. Yokutsan groups are archeologically manifested by large projectile points and a mano/metate system for milling, while the later complexes are distinguished by light projectile points, use of bow and arrow (one could suggest this is reason for the success of the Miwok although Moratto may not agree), bedrock mortars, and cobble pestles. Steatite vessels, and clam shell disc beads (Moratto and Riley 1980:26) are also part of this late Miwokian repertoire.

Moratto's correlations between inferred linguistic events and archeologically observed changes are based upon similar age ranges attributed to each entity (Moratto 1981). The danger attributing an archeologically defined entity to a linguistic entity is well known and extreme caution and thorough research must both be employed when doing so.

Historic Background

There is disagreement among authorities as to who occupied the project area in the Protohistoric Period. It may have been Northern Valley Yokuts or Southern Miwok, or it could have been a transition or buffer zone between the two groups (see Appendix 1). Moraga's expedition is believed by Cook [1960:284) to have passed by Burns Creek in September of 1806, and he and his party did not observe any permanent villages in the region (see Appendix 1). There may have been wet season temporary camps which were abandoned when he passed in the late summer.

This portion of Burns Creek was mined for gold but determining who mined in the area, however, would require more time than was available for this study.

A reconstruction of the acquisition of Sections 18, 19, and 30 is shown in Figure 1, Appendix 1. The northeast quarter of Section 30 was acquired by Joseph P. Wing, under the Military Bounty act in February 1861, and assigned to Joseph Moray.

Moray also owned a 250 acre ranch on Burns Creek, seven miles below Hornitos. The northeast corner of the ranch was at the mouth of Greaser Gulch. Moray and his partners, J. Pointel and Jacques Dejian purchased the ranch from Peter Navarre for $1000 on August 2, 1861 (Mariposa County Deeds M:300). For the fiscal year of 1860-61, Navarre had paid taxes on $800 in improvements on his property, but listed no value of real estate or acreage. He also listed $50 in personal property. For the following fiscal year, Navarre paid taxes for $1500 in improvements on his ranch on Burns Creek. His personal property for the year consisted of four horses valued at $200. After Moray bought the land, he was assessed taxes on a "portion of ranch adjoining Merced County." His claimed value of the land and improvements was $500. No personal property was listed (Mariposa County Assessment Rolls 1860-61, 1861-62, 1862).

In January 1866, Moray sold several parcels of his land to John B. Bennett of Merced County. Included in this sale were both the Northeast ¼ of Section 30 (Township 6 South, Range 16 East) and the ranch bought by Moray and company. In 1867, Bennett began obtaining patents to various parcels of land, as well as purchasing the patented land of others.

The Assessment Roll for 1867 lists Bennett as the owner of a barn and enclosure on the northeast side of the Millerton

Road about 1¼ miles north of Robert Simpson's Ranch (at the crossing of Bear Creek by the Millerton Road). This is approximately the location of the modern-day Waltz Ranch. The 1874 Merced County Map shows J. B. Bennett as the owner of land in Sections 19 and 30 in Merced County, and a structure is shown on the south side of a tributary to Burns Creek. This is probably the Waltz Ranch Site. This same location had a structure as far back as 1854. The owner of the structure was Howell (General Land Office plat, fractional portion Township 6 South, Range 16 East, 1854). No other evidence of early ownership could be found in the county records, but a long span of historic usage of the Waltz Ranch Site can be inferred.

Bennett was also listed as the owner of one adobe building situated on Burns Creek, about one mile north of the barn and enclosure at the Waltz Ranch Site, within Mariposa County. The improvements at the two sites were valued at $750 (Mariposa County Assessment Roll 1867).

The location of the adobe structure is approximately the location of the historic foundation on CA-Mrp-592, although the 1870 General Land Office map does not show a structure at this location, there is an improved field indicated on the east side of Burns Creek on the terrace which straddles the line between Sections 18 and 19. This may indicate that the structure was not in use at this point or was simply not seen by the surveyors.

In 1872, Bennett owned 4,960 acres in Mariposa County. His personal property included 3,100 sheep and 1,250 lambs. (Mariposa County Assessment Roll 1872). As no other livestock is listed, it can be concluded that Bennett's land in the Burns Reservoir project area was used for grazing of sheep. The structure associated with the fence at CA-Mrp-591 may be a lambing pen related to this period or perhaps even earlier to Navarre's or Moray's ranching activities.

A pioneer merchant of Mariposa, William A. Grade, began buying Bennett (and others) out in 1877, eventually acquiring:

> 10,000 acres of land in Merced County, where he raises cattle, hogs and sheep. At one time he devoted his time to the culture of cotton, planting 200 acres to this product; he realized 400 pounds to the acre, for which he received thirteen cents a pound (Lewis Publishing Company 1892:250).

In 1880, Grade owned in Township 6 South, Range 16 East, the E ½ and the SE ¼ of the SW¼ of Section 18; Section 19 east of the county line; and the fractional NE ¼ of Section 30. The only improvements within the area were valued at $50 and were located in Section 19 (Mariposa County Assessment Roll 1880). This may indicate that the structure at CA-Mrp-592 was in use at this point or another structure within the section outside the project area.

Research Design

The conceptual basis for the research design proposed by Peak and Associates for the intensive cultural resources survey and evaluation for the proposed Burns Reservoir, Merced County Streams Project, is presented below.

Research designs are conventionally regarded as structured on three hierarchical levels. The highest-order level (Level 1) is the theoretical premise or paradigm upon which the research design is based. The most popular paradigm today is cultural materialism, which simply asserts that human behavior, at least in a statistical sense, is based upon economic decision-making. This forms the basis underlying our research design. Use of the concept that people make rational economic decisions supplies a causal factor missing in the use of Systems Theory as the conceptual basis (see Clewlow 1976). Systems Theory is viewed in this regard as a subparadigm which is useful in structuring relationships between different components of the entities being studied.

The second hierarchical level (Level 2) within a research design postulates a set of orderly questions about general human behavior, structured in terms of the assumptions of the first-level paradigms and how those questions can be methodologically addressed. This level identifies the kinds of research concerns which can be explored, given the constraints of the project and the nature of the data. Moratto (1981) and Fowler and James (1981) refer to this level as *Research Domains*.

The lowest level of a research design (Level 3) is the implementation of the design for the particular project, the research strategy. It consists of the specific research questions to be considered and how they will be addressed by the data recovery techniques, including research and interviews as well as direct field inspection.

The very limited kinds of data available from a cultural resource survey, as opposed to excavation, limit the research concerns or domains (Level 2) and/or questions (Level 3) which can be confronted. Thus, the major function of a cultural resources survey is to identify the kinds of resources present and how they might potentially contribute to the exploration of higher-order research concerns and/or particular research questions.

The archeological research concerns can be generally divided into four areas: (1) cultural change, (2) subsistence and settlement, (3) cultural and social interactions, and (4) paleodemography. Numerous research questions can be generated from any of these research concerns. Below are presented a number of examples generally selected to reflect those questions which can profitably be addressed by investigations in this region.

Prehistoric Research Questions

Research Question 1.--If indeed, as Moratto believes, the Yokuts preceded the Miwok in the foothills, then two settlement systems may have been operative. First, if the populations of the valley and foothills were resident in either territory, then the permanent village with its subsidiary hamlets should be archeologically perceivable prior to the Late Period. In other words, sites with earlier components should be in the same locale as the later components, and the respective artifact inventories should appear similar, although varying in particular detail.

If the settlement systems were different in the earlier period--e.g., if the Yokuts practiced transhumance--then the settlement system in the project area will appear incomplete. Seasonality studies will reveal gaps in the yearly cycle. Certain artifact types may be scarce or absent if the resources associated with their use were distant. A thorough study of the resource potential of the environment would reveal a lack of carrying capacity for a year-round subsistence cycle for a hunting and gathering society.

Research Question 2.--Moratto et al. (1978) have postulated that there was an arid interval between A.D. 700 and A.D. 1200 which severely affected and disrupted the social, economic, and demographic relations and structures at that time. Large nucleated villages of a permanent character were replaced by smaller villages of much less permanence. If so, then sites with Eastgate Expanding Stem and Rose Spring Series points will be absent or scarce and confined only to small camps of transitory nature. If not true, then such sites should not reveal any sudden disruption of the settlement system. Although changes may take place, they may be distributed over a longer period than that postulated by Moratto et al. These changes may not be correlated with the proposed arid interval to any significant degree. The finding of temporally diagnostic forms will be important in addressing this research question as well as observations on site size, artifact density, associated facilities, etc.

The major argument is not whether any arid intervals have occurred in the last 2,000 years but, rather, to what extent they affected human occupation. If the evidence from the work on the west side of the San Joaquin has any significance, the effects of the postulated arid interval may have had a mosaic rather than a general effect (see Olsen and Payen 1969; Pritchard 1966). Any evidence, pro or con, for the settlement of this part of the valley during that period will be a plus.

Research Question 3.--Ericson (1977) has postulated that the Sierran quarries were not systematically exploited after A.D. 500. These quarries apparently supplied most of the obsidian upon which the bifaces in the Central Valley, during the

period prior to A.D. 500, were created (Jackson 1974). The quarries were not abandoned, of course, but the extensive quarry operations ceased and local peoples simply picked through the old debris. In the summer, when they moved into the Sierra, they traded it to other peoples in the foothills. Gayton (1948), for example, records that the Mono traded unfinished obsidian blades to the Yokuts.

If Ericson is correct, the sites with artifacts diagnostic of the period prior to A.D. 500 should reveal evidence of biface importation--i.e., either bifaces or large bifacial thinning flakes (BTFs) struck from them. Later occupations will demonstrate much smaller BTFs and, when sourced, they may not be from the Sierran quarries.

Research Question 4.--Clewlow hypothesized that Castle Reservoir had no sites in the areas surveyed because it was a "buffer" or boundary territory between the Yokuts and the Miwok. This hypothesis has a few weaknesses since sites have been found in the reservoir; moreover, Castle Reservoir is solidly within the territory ascribed to the Yokuts. Further, such buffer zones, while not occupied by villages, are certainly occupied by seasonal and/or activity-specific task groups. Burns Reservoir, to judge by the established boundaries, is more likely to be a "buffer zone."

If the Burns Reservoir area is a boundary territory between two hostile groups, sites will be small and placed inconspicuously to avoid detection (Hickerson 1965). Artifacts indicative of warfare (spear points rather than arrow points?) may be present and no domestic tools will be apparent (e.g., manos, metates, pestles, bedrock mortars).

If the absence of sites is real, as Clewlow believed, and not a matter of the field techniques needed to discern them (e.g., heavy grass cover overlying sedimentary layers), then the factors which preclude settlement in the area should be recognized. These factors can be many and varied, but include: lack of resources, lack of available water, lack of lithic raw material sources, and lack of suitable combinations of factors for settlements (i.e., two or more of the above are lacking). Even given post-European disturbances to the environment, these kinds of changes should be evident, and some characterization of the pre-contact environment possible. If, indeed, there are no sites, aridity, no doubt, played a major role and water resources will have to be carefully examined.

Research Question 5.--As is clear from Clewlow's (1976) brief summation of the Yokuts literature and Wallace's (1978) more comprehensive survey, the settlement system practiced by the Yokuts in the ethnographic past is relatively unknown. The presence of the Miwok to the east would obviously preclude

any transhumance into the Sierra except prior to the postulated movement of the Miwok into those areas. The Yokuts on the east side would have to exploit the resources in the Central Valley and the adjacent lower hills. The region was described by the Spanish as extremely rich in game and resources, so a stable subsistence base was eminently practical. We postulate that the Yokuts groups maintained permanent villages, organized around a sub-tribe affiliation, which were sociopolitically related to other villages within the dialectical tribal territory. Those villages were surrounded by subsidiary hamlets. Wallace (1978) notes that the village plan of the Northern Valley Yokuts was not so organized (rigid?) as that of the Yokuts groups to the south. Archeologically, a large site will be surrounded by smaller sites which have a tool industry indicative of a range of tasks--i.e., the hamlets will have an industry similar to that of the villages but in less quantity. Special purpose sites will have more specialized industry with fewer tool types. The pattern should differ from that of earlier periods.

At Burns Reservoir, large sites will be located on knolls overlooking a watercourse, sufficiently high that seasonal flood waters would not submerge them. Smaller hamlets will also be found on knolls, but their remains will be much smaller and the knolls will likely be smaller also. Sites with a specialized artifact assemblage may be found on other topographic features than knolls.

Burns Reservoir lies near the boundary of Yokuts and Miwok. If the Yokuts occupied the area, large sites will be surrounded by smaller sites, but an intensive analysis will not recover any evidence of transhumance.

If the area was Miwok, then some evidence of transhumance would be present. If Yokuts, the artifact inventory should conform to Bennyhoff's Stockton District or to Olsen and Payen's (1969) Panoche Complex. If Miwok, the Madera Phase is probably the most likely archeological manifestation (Moratto 1972). The Mariposa Complex would seem to be primarily indicative of the Yosemite region.

Other research questions, based upon research domains such as demography, are possible but, given the limitations of a cultural resource survey, they cannot easily be addressed. The list presented is by no means regarded as inclusive, as new insights will undoubtedly generate others, and others will be generated from a closer scrutiny of the one presented.

Historic Research Questions

Research Question 1.--It is suggested that the earliest industry in the project area, besides mining, was animal husbandry, particularly sheep. Cattle ranching was a later introduction.

The archeological manifestations of these two ranching occupations should differ and the cattle ranching should be later. Sheep are smaller than cattle and the fencing demands should vary accordingly. A rock fence will suffice for sheep, but it will not for cattle.

Research Question 2.--The historic research has revealed that Burns Creek was mined very early, and ranching quickly became the dominant industrial activity. The earliest historic evidence then should be mining, and mining should not appear again until the smaller dredging operations in the 1930s. Is this substantiated by the archeological evidence?

Research Question 3.--John Bennett was a sheep raiser in the project area in the 1860s and 1870s. He owned an adobe structure on Burns Creek, approximately 1¼ miles north of his ranch (probably the Waltz Ranch location). Is there evidence of a structure at this locale; and does it appear to be of adobe construction?

SURVEY METHODOLOGY

The cultural resource survey of the project areas for the Merced County Streams Project was very intensive designed to locate all cultural resources, regardless of size or significance. The major purpose of the cultural resource survey is to supply the Corps of Engineers with sufficient information and documentation to permit viable management planning for the resources within the project area.

As a part of the background research, pertinent literature was reviewed as well as the reports on previous surveys conducted for the Merced County Streams Project (Mohr 1951; Clewlow 1976; Wilson 1978). No site specific record search was requested for the reservoirs since the records on identified cultural resources within the project areas was provided by the U.S. Army Corps of Engineers. Maps and files were examined at the Office of Historic Preservation for information on archeological sites which are in areas adjacent to the study area. A zone from a lower elevation of 125 feet to 800 feet and extending north of the Merced River from Owens Reservoir was delineated since sites within that belt would be topographically and environmentally comparable to the study areas.

As expected, few sites have been recorded within this zone beyond those identified by Clewlow's 1976 surveys. Joe L. Pope (personal communication 1982) stated that no other systematic surveys have been conducted in this region which accounts for the low number of recorded resources. It is certain that sites of all types occur within this zone, but to date have not been recognized and recorded.

Excluding all sites which have been identified in the present study area reservoirs and those at Owens, Marguerite, and Mariposa reservoirs (Clewlow 1976), there are four petroglyph sites within the selected zone of record review. The three other known sites in this zone appear to be habitation sites. Of these sites, CA-Mer-214 is geographically closely related but downstream on Bear Creek from Bear reservoir. The site record form suggests that this site was probably a large village as over two hundred bedrock mortar pits and two possible house-pit depressions were noted.

The surveys at Owens, Marguerite, and Mariposa reservoirs were designed to sample the gross pool acreage and were not intensive in nature (Clewlow 1976). Sites recorded at Owens Reservoir include six bedrock mortar loci and one historic foundation. At Marguerite Reservoir an historic foundation and an isolated metate were the only resources found. At Mariposa reservoir, there are seven historic and nine prehistoric sites, of which one is midden/bedrock mortar site, and eight are bedrock mortar loci. The seven historic remains include mud mortar and slab foundations and chimneys probably related to the early mining era (Clewlow 1976). There is little comparative information since the site record forms do not contain details of construction mode nor any illustrations of the historic features.

It is difficult to determine what prehistoric settlement system is present since the surveys were incomplete. More prehistoric sites may be found in these reservoirs should an intensive survey be conducted, and a system or pattern might be defined.

An examination of the National Register of Historic Places and the monthly supplements revealed that no sites on or found eligible for the Register are located in or within the immediate vicinity of the project area.

The presence of vernal pools in the project area was a complicating factor, since their possible exploitation by the Native Americans is a recently mentioned topic in the literature. Tool kits designed to exploit an ephemeral resource such as vernal pools can be expected to be specialized in character and variable. No depth would be expected at these sites and they should consist of a lithic scatter of both chipped and ground stone artifacts.

Those areas in which vernal pools exist or could have existed in the Burns Reservoir project area comprise almost all of the lower portion of the project area which was surveyed. It would be necessary to employ a sort of "super intensive" survey to insure that no evidence of ephemeral use of these resources was overlooked. Without previous knowledge that such sites existed in the project area, we did not feel that this level of effort was justifiable. In order to determine the

potential data return accruing to this sort of endeavor, the area adjacent to the existing Burns Creek Dam (comprising about 25% of the proposed reservoir area) was surveyed by three three-man teams utilizing a crew spacing of three meters. All artifacts perceived were plotted on field maps. Care was taken to perceive any association between two or more artifacts in the same loci around the pools. Other areas with a high density of vernal pools, or an especially large pool, were surveyed with the same care as above.

The remainder of the project area was surveyed by 10- to 15-meter transects, depending on the terrain. Known locations of previously recorded sites were examined carefully. Coverage rate was predicated on 30 acres a day per person. The downstream areas were surveyed by two individuals on either side of the creek. The coverage rate of 30 acres a day per person was retained since it insured a thorough examination of likely areas, even those just outside the project boundary corridor.

When a resource was encountered, the team gathered together and helped in its recordation. Scaled maps were prepared for all sites with a compass and tape, or a transit and stadia rod if the situation warranted. The surface was carefully examined for artifacts and those noted were flagged. All artifacts found were then plotted on the map. Only temporally diagnostic artifacts were noted and illustrated. Boundaries were established by how far the lithic scatter extended.

All sites were augered to determine if any subsurface cultural deposits were present. A cultural deposit in this context is defined as an artifact-bearing soil, not necessarily an organic midden. The auger holes were excavated with an auger, if possible, or with a shovel if the soil proved too rocky. The excavated soil was carefully examined for artifacts, but not screened. All were backfilled when finished. They were excavated to sterile or as far as the auger or shovel could effectively reach.

The sites were photographed in the environmental setting in black and white. All features and other pertinent artifacts were also photographed. Particular attention was paid to bedrock mortar loci, petroglyph panels, and surface artifacts of a possibly diagnostic character. Color slides were made of particularly important or unusual sites.

The field crew consisted of 11 to 12 professionals organized into three teams of two or three people each under one crew chief. The field director was in charge of one crew, but also supervised and delegated the daily tasks to the crew chiefs.

The resources were recorded on the approved site survey forms, and their location was plotted on both the appropriate U.S.G.S. quadrangles and the Corps of Engineers design maps of the appropriate proposed reservoir. The isolated artifacts

found were plotted by the crew on their field maps. At the end of the day, the crew chief plotted them on his/her map, and these data were then conveyed to the field director. A series of symbols was devised to represent the types of artifacts found, as well as their context.

The prehistoric sites were classified according to the presence/absence of the following elements: bedrock mortar loci, midden, petroglyphs, and housepits. The historic elements recognized were buildings/foundations, walls, fences, recent trash, and mining operations.

In the prehistoric classification, bedrock mortars, midden, or petroglyphs can be a site or an element of a site. Housepits are usually an element associated with middens. A site with three or more elements is a complex site. A prehistoric site with an historic component will usually be regarded as a complex site, but not in all cases--especially if one other element, such as a small disturbed midden, is only weakly represented.

SURVEY FINDINGS

The cultural resource survey of the proposed Burns Creek Reservoir located 17 cultural resources, four of which had been reported earlier by Mohr (1951) and not found by Ancient Enterprises (Clewlow 1976). The prehistoric resources encountered were: six middens with associated bedrock mortars (CA-Mer-253, -241, 76, and -244 CA-Mrp-596), one midden with associated artifacts (CA-Mer-79), two lithic scatters (CA-Mer-80 and -252), and four isolated BRM loci (CA-Mer-245, -251, -252; CA-Mrp-591, -593). In addition, CA-Mer-52, a petroglyph site recorded by Mohr, was relocated and carefully recorded. In addition, a cupule rock was found associated with CA-Mrp-591. Four historic resources (CA-Mer-247, CA-Mrp-592, -594, and -595) were also found, one of which (CA-Mrp-592), is next to and included with a prehistoric site (Map 3). All of the resources reported, except isolated artifacts, were found in the immediate proximity of Burns Creek or its tributaries, except CA-Mer-244, which was near a spring (Table 1; Map 3).

The seven midden sites are all large sites (all but one are in excess of 100 meters in their longest dimensions), usually associated with a scatter of tools, debitage, and fire-cracked rock. Depth of midden ranges from 30 to 100 centimeters (cm). There were probably more midden sites present along this stretch of Burns Creek originally, but mining operations may have destroyed them, particularly in the upper reaches of the creek in the project area.

Cultural deposits may exist at a few other sites, especially those in the upper reaches of Burns Creek, but the augering did not produce any subsurface artifacts, and their deposits

TABLE 1

LIST OF RESOURCES

Site	Type	Size (in m^2)	Prehistoric Features					Historic Features						Location	Elevation (in feet)
			Bedrock Mortar	Lithic Scatter	Midden	Pecked Glyph	Cupule	Foundation	Fireplace	Wall	Mining	Road	Other		
CA-Mer-52	P					X	X							Reservoir	280
CA-Mer-76	M	22,500	X	X	X									"	290
CA-Mer-79	M	4800		X	X									"	290
CA-Mer-80	L	2700		X										"	290
CA-Mer-241	M	3375	X	X	X									"	290
CA-Mer-244	M	13,500	X	X	X									"	320-350
CA-Mer-245	B		X											"	275
CA-Mer-247	H												X	"	290
CA-Mer-251	B		X											"	290
CA-Mer-252	B/L	9000	X	X										"	310
CA-Mer-253	M	5250	X	X	X									"	340
CA-Mrp-591	B/P		X											"	320
CA-Mrp-592	B/H		X					X						"	340
CA-Mrp-593	B		X											"	325
CA-Mrp-594	H									X				"	325
CA-Mrp-595	H							X	X					"	310
CA-Mrp-596	M	4500	X		X									"	325

Legend -- Site Types: B = Bedrock Mortar; P = Petroglyph;
L = Lithic Scatter; C = Complex Site; H = Historic Site;
M = Midden

NOTE: CA-Mer-247 is historic graffiti

were clearly not an organic midden. Tools and debitage were only rarely found in the auger holes, but fire-cracked rock was commonly present to mark the occupations. Augering at CA-Mer-241 revealed the presence of a possible house floor of hard-packed clay with charcoal in it.

Five of the middens are found on the lower reaches of Burns Creek, and its minor tributary to the east. CA-Mer-76 and -79 are large middens located on flats along Burns Creek or its tributaries. They are both relatively flat and covered with grass and tarweed. CA-Mer-76 is associated with 96 bedrock mortars, 71 of which are on one exposure. There are no bedrock mortars with CA-Mer-79, but it is not too far from CA-Mer-76, and their inhabitants may have shared facilities. Both have been disturbed by the dirt access road, and there is a small cistern on CA-Mer-79.

Two of the middens are found along the tributary which flows into Burns Creek from the east. CA-Mer-253 is a probable large midden located on a flat, with three loci of bedrock mortars on an adjacent hill. The midden probably extends under the Morrison ranchhouse (Waltz Ranch). The flat has been disturbed by plowing and probably the construction of the house and related facilities. CA-Mer-241 is a smaller midden located at the junction of the tributary and Burns Creek. It is light rounded, covered with range grass, starthistle, and Bermuda grass. There has probably been some lateral erosion due to the seasonal runoff, since a light streamward terrace exists.

CA-Mer-244 is divided into three small midden patches distributed near exposures of bedrock. It is associated with a spring, the excavation of which has disturbed the site. There are three elongated disturbed areas adjacent to the intermittent creek which flows through the site. The spring and the disturbed areas are not located on the three patches of midden.

CA-Mrp-596 is the only definite midden associated with the upper portions of Burns Creek in the project area. The midden is small, approximately 30 meters in width, and located well above the creek (50 meters). Two bedrock mortar exposures are located within the midden area, and one in the creekbed. The midden has not been obviously disturbed, except by a barbed wire fence. There has been considerable disturbance of the creek-banks below by mining, probably with a dredge.

The artifacts associated with the middens (not necessarily with each one) are flakes or flake fragments of silicates, quartz, obsidian, a few tools (generally of the "expedient" types such as large scrapers or choppers), a few silicate cores, bowl mortar fragments, pestles (both shaped and cobble), and mano/metate fragments. No projectile points or bifacial reduction debitage were observed on any site, and each site was examined carefully for such evidence. One site (CA-Mer-241)

produced a few fragments of chiastolite crystal, which is an inferred decorative import. Chiastolite is a component of the slate in the Mariposa formation in Bear Creek, and it would not have to be imported far.

The debitage is predominantly from silicate raw materials, although a few flakes of obsidian were present in two sites. Obsidian was probably used at all of the sites, but the generally small size of obsidian flakes makes them difficult to observe without screening. A great deal of quartz debris was also recorded, but it is difficult to determine if this is a result of natural or cultural factors without a detailed laboratory analysis.

The associated mortars are all in exposures of bedrock and are, for the most part, conical in shape. The majority of the "cupules" listed in Table 1 are best regarded as incipient mortars rather than as petroglyphs. It is important to note, at this juncture, that the largest exposure of bedrock mortars at CA-Mer-76 is associated with a vernal pool (cow wallow). The numbers of mortar holes buried by the vernal pool deposits suggests that the pool was not present, or at least not so extensive, when the site was aboriginally occupied.

One lithic scatter (CA-Mer-80) is a large and sparse scatter of silicate flakes, a few tools, and some ground stone located along the lower flat portions of Burns Creek. A carefully examined 10 x 10m surface unit in its center produced only two artifacts, which graphically demonstrates the diffuse surface distribution. In fact, it is probably best regarded as a lateral extension of CA-Mer-79, a definite midden site further upstream. The only obvious disturbance is the road.

Another probable lithic scatter (CA-Mer-252) is located at the head of the present dam. It is very large, but with a low surface density of artifactual material. It is associated with a bedrock mortar locus with six mortar holes. CA-Mer-245, another nearby bedrock mortar locus, was probably also originally associated. Augering produced no evidence of a midden development, although some possible fire-cracked rock was found in one test at 20cm in depth. The site is obviously in a very disturbed state, and it may have been substantially destroyed by the construction of the present dam. As the petroglyph site, CA-Mer-52, is probably also associated, this destruction is very unfortunate. No small isolated lithic scatters were found. Their lack is not believed to be part of the methodological field procedures, since the coverage rate was intensive and designed to find such ephemeral scatters. Such small lithic scatters should not be confused with isolated artifacts, some of which were encountered and recorded.

The other important prehistoric settlement type is the isolated bedrock mortar outcrop or exposure. There were seven located throughout the project area, but particularly in the

lower reaches of Burns Creek. The mortars found associated with the sites along the lower portion of Burns Creek total 275, while those in the upper reaches in the project area only total 41. An obvious preference to settle on the portions of the creek where it fully enters into the edge of the valley floor is indicated. The mount of bedrock mortars present at each loci ranged from four to thirteen mortar holes. As mentioned earlier, mining operations, particularly early placer and hydraulic mining, destroyed and/or disturbed many sites, along the upper reaches of the creek and the lack of observed midden at many of these sites can be attributed to their destructive effects. CA-Mrp-591 is associated with two outcrops with bedrock mortars which are obviously out of context due to mining operations which have dislodged them from their original locations. One exposure is, in fact, on its side in the creekbed. As the measurements indicate, these are not shallow, incipient bedrock mortars which one usually expects for isolated bedrock mortars; thus, some associated occupation should be present. Its lack is, again, obviously due to the destructive effects of mining operations.

CA-Mrp-592 is an isolated bedrock mortar site located along the upper reaches of Burns Creek. The outcrop is located well above the creek. There is some discoloration of soil in small patches which suggests midden development may have once existed nearer the creek. The mining in this portion of the creek has been so extensive that such deposits have been destroyed.

There were two petroglyph sites found. CA-Mer-52 was previously recorded by Mohr in the Basin River surveys. They have been pecked into vertical exposure on the edge of a low bluff. The five panels are deeply pecked, but exfoliation has probably destroyed some portions of the panels. Moss growth is probably also a factor. The site is likely inundated frequently, since it lies very near the base of the present Burns Creek Dam. Some of the design elements recorded by Mohr no longer are apparent, and one element recorded by Mohr has definitely been disturbed by exfoliation. The site was probably originally associated with a large habitation site (CA-Mer-252), which was likely destroyed by the borrow operations to build the present dam.

The design elements at this site are more limited in variety than those at nearby Bear Creek. The predominant motif is circular or oval in form and some of these are cross-hatched or have internal parallel lines. The style is that of the Central Sierra Petroglyph area and dominated by the curvilinear patterns. The motifs are more deeply incised into the rock face than any identified at Bear Creek, but this is due to the softer rock sandstone. There are no recognizable compositions and this is representative of most Sierra Nevada rock art sites where their occurrence is rare (Payen 1962).

A cupule rock is associated with some bedrock mortars at site CA-Mrp-592. There are at least 53 cupules on two vertical panels. The panels face the creek and are located right above

its edge. Whether they overlooked the creek originally, cannot be ascertained, since mining operations have widened the creek to some extent. The soil is very sandy, which suggests mining has heavily disturbed the deposits surrounding the bedrock mortars' exposure and its associated petroglyphs. The bedrock mortars are found atop the exposure, and would have been reached by climbing. The presence of the cupules on the lower edge indicates that edge of the exposure was always exposed.

There were three historic resources found. Sites CA-Mrp-594 and -595 were isolated structures, and the other was associated with prehistoric site CA-Mrp-592. All of the sites are collapsed stone structures. The historic structures on CA-Mrp-592 and -595 are apparently collapsed stone cabins. The other historic structure, CA-Mrp-594, is actually a complex of structures representing two stone walls which connect two ridge capstones except for a gap at the creek, and it may have bridged the creek at one time. One wall is associated with a rectangular open structure. Too small to be a cabin, it is probably an overnight shelter or a lamb pen. The structure appears too small to contain all but the very youngest calves. None of the observed structures appears intact, except for the walls on CA-Mrp-594. No grouting is apparent in the interstices between those portions of the walls still upright.

The results of the survey of the prehistoric resources suggest a winter/spring occupation for most sites, particularly those in the flat lower reaches of Burns Creek. The intermittent nature of Burns Creek today was probably also a fact in the past, at least the immediate past. The two sites which may have permitted some summer occupation are CA-Mer-79, where the large pool contained enough water to harbor a resident fish population, and CA-Mer-244, with its associated spring. The large midden site near the old Waltz ranch, CA-Mer-253, is another possibility as a spring may exist in that area. Again, winter occupation can be legitimately assumed. A summer or fall occupation would have to be tested by archeological investigation.

There has been some discussion in archeological circles in recent years about the possibility that vernal pools were exploited during the winter by Native American groups. Despite the intensive examination expended on them, no association between a definitely utilized artifact and a vernal pool was found, except near an established site. For example, there is a very large vernal pool between the proposed Burns and Haystack reservoirs; it is even apparent on the USGS Haystack Mtn. 7.5' quadrangle. It is sufficiently far from the established sites, that any artifacts found around it may belong to a tool kit exploiting it. The results, however, were negative. The large cobbles of the North Merced Gravel pediments are plentiful in vernal pools, and some look a little battered, but in the context of their depositional history, quick flowing stream-laid deposits, some battering should occasion no surprise.

The chronological assignment of the prehistoric resources cannot be adequately addressed at this time. The surficial surveys did not find any temporally diagnostic artifact forms, and the limitations of archeological surveys preclude the collection of datable radiometric material. None of the sites produced any definitely associated historic artifacts (trade beads, iron tools, etc.).

The Haystack, Bear, and Burns reservoir areas were believed to be occupied in the ethnographic period by the Central Southern Miwok. Archeologically, the presence of cobble pestles, and the art motifs at CA-Mer-52, may support this contention. But the presence of bowl mortars on most of the large sites, a few shaped pestles, and, more importantly, the dearth of stone projectile points and bifacial reduction debitage suggest this may not be a tenable position. A possible Yokut occupation is suggested as another alternative. James West, Bureau of Reclamation (personal communication) has surveyed sites at the same latitude on the west side of the valley which are notably similar --i.e., large middens, crude bifacially or unifacially worked tools, a few basalt and silicate flakes, and a few bedrock mortars and cupule rocks. Fire-cracked rock is the most common artifactual material on the surface.

CONCLUSIONS

The limitations of an intensive cultural resource survey preclude addressing many research questions, particularly those concerned with the social interaction and demographic research domains. The research domains which can often be addressed within the inherent limitations of the cultural resources survey are those of cultural chronology and settlement system/subsistence practices. Even research questions generated from those research concerns or domains can be addressed only in a superficial fashion since only surface features and artifacts can be used. With these limitations in mind, the results of the intensive cultural resource survey can be presented.

There were no temporally diagnostic artifacts found on any of the sites (such as projectile points, beads, or pottery). The bedrock milling stations are usually considered a late mainfestation, but their temporal entrance into this area has not been firmly established as yet. We can probably justifiably assume that the upper component of most of the sites represents the Upper Emergent and Historic periods. The groundstone component included bedrock mortars, manos, slicks, metates, and cobble pestles, possibly shaped pestles, and bowl mortars. It should be noted that only the downstream portion of Burns Creek in the reservoir area has produced bowl mortars. The higher level of destruction of the upstream sites by mining operations may have simply destroyed evidence of the latter. The lack of bowl mortars and other such easily observable artifacts can be caused by local "pot hunting," but it would be difficult to

explain why it was confined to the downstream region only if such is the case.

The seasonality of the occupation in this part of the San Joaquin Valley will be predicated upon the presence of water. The present flow of Burns Creek ceases to any real extent in the summer, although there are some large pools with a resident introduced fish population in the downstream reaches above the present dam (such as those near CA-Mer-79). The sum of the evidence suggests only a winter/spring occupation would be feasible.

As mentioned earlier, Moraga's expedition through the region in September, 1806 did not find any permanent villages along Burns and other nearby creeks. This historical evidence would be supportive of a seasonal occupation in the winter and spring and an abandonment in the hot summer and fall.

The larger sites with middens and bedrock milling stations probably represent small villages, occupied seasonally during the winter and spring. The smaller sites, whether lithic scatters or bedrock milling stations, likely represent task-specific parties or small family groups exploiting particular resources. The sites found in the proposed Haystack Reservoir, located just to the west on the edge of the valley floor, are similar to the large midden sites along Burns Creek, and may have been occupied by related groups. The lack of any quantity of bedrock mortars, except at CA-Mer-76, may indicate it focused as a central gathering place to process staples such as acorns during the winter and spring.

The question of the location of the permanent large villages from which they seasonally dispersed, offers two alternatives. First, Moraga's expedition in the early fall did observe permanent villages along the Merced and the San Joaquin rivers (probably Yokut), and they could well be the major villages from which groups would disperse in the winter, and especially the spring to exploit the ripening greens and the slow water native fish population (see Schulz 1981). No mollusk shell fragments or crayfish remains were observed on the middens, but they are present in the creek bed, and must be considered possible food sources, as well as the local native fishes. Large game, such as elk, deer, and antelope would have been present in the grasslands and have provided a major resource.

Alternatively, the summer and fall villages would have been up along the major creeks and rivers in the foothills. The large midden sites along the upper reaches of the proposed Bear Reservoir may, indeed, represent such permanent villages. CA-Mrp-610, with its large possible ceremonial structure, many housepits, comparatively dense lithic scatter, and many bedrock milling stations would be a likely candidate for Moratto (1972) "Village Community Center." The amount of rock art along Bear Creek, suggests it was an important focal point for the regional

settlement systems. The upper portion of Burns Creek above the project area has not been surveyed, but it may well contain the same settlement system complexity found along Bear Creek.

Two contrasting settlement systems are suggested, both archeologically determinable by the proper investigative techniques. First, the major sites along Burns, and by extension along Black Rascal Creeks, are also temporary base camps during the winter/spring wet season. The permanent base camps are west along the major rivers. Second, the sites along Burns and Black Rascal and Bear Creek are the permanent camps. The summer/fall camps are in the high foothills to escape the heat and reduced water supplies.

A permanent Village Community Center (see Moratto 1972) will have one large village, with several to numerous satellite villages. The Village Community Center will contain evidence of a ceremonial structure. Temporary encampments will be smaller, but varied; house remains will be few; and no large ceremonial structures will be present in the area. All of the above have archeological correlates, and the determination of the season of occupation, especially for the sites along Bear Creek will be important.

There is the possibility that upstream mining operations may have altered the flow of the creek--i.e., channeled the flow down another creek or into a ditch--but that does not seem probable at this time. In short, while a few sites may have offered the chance to summer over in the project area, the evidence suggests a winter/spring occupation only.

The settlement system/subsistence research questions need data such as site type, material culture concerned with subsistence, and ecological context. The sites range in type from large middens to isolated bedrock mortar loci. The larger sites, to judge by the numbers of bedrock mortars and midden size, are along the downstream areas above the present dam. Mining operations could have destroyed a large portion of the upstream middens, but the bedrock mortar loci in those locations still contain fewer mortars. Isolated artifacts were found in the surrounding territory, but no apparent activity sets are apparent.

No burials were found in the course of the survey; thus, many demographic research questions cannot be addressed. A burial was previously located at CA-Mer-228 near the proposed Haystack Reservoir, so human remains should be regarded as probably present in these sites as well.

Examination of the debitage on the surface of all of the sites where it occurred revealed only sparse core reduction categories. No bifacial reduction debitage was found, a dearth observed elsewhere in the region. There were intensive examinations of $10m^2$ in each site which offered the potential to locate BTFs (thus, the absence can be considered real). It is correlated with a lack of projectile points. What this absence or

scarcity of points and bifacial reduction debitage means in terms of manufacture of hunting implements and hunting practices will require further investigative testing.

The seeming scarcity of obsidian debitage on the surface of the sites, even after a "nitty-gritty" examination, does contrast with other sites of believed Miwok origin. Peak's (1976) investigations of CA-Mad-133, along the Chowchilla River in Madera County (500 feet), generally inferred to be Miwok, has produced a non-utilized flake sample dominated by obsidian (67%). The use of obsidian for tool forms is even higher. Clearly obsidian is the prime raw material. Ericson's (1977:210) figures indicate the Southern Miwok derived 73 percent of their obsidian from the Casa Diablo quarries.

If the occupants were Yokuts, however, the obsidian total should be lower. Peak's (1978) investigations at CA-Mer-215, in the central section of the Great Valley, in definite Yokut territory presents the frequency of obsidian to other raw materials in the debitage total. The obsidian accounts for only five percent of the utilized and non-utilized flakes, clearly a contrast with those sites on the Chowchilla River. What little obsidian is present is primarily derived from the same source, Casa Diablo (Ericson 1977:210). In short, the dearth of obsidian observable on the surface of the sites, if indeed it is not a matter of sampling, suggest Yokut occupation.

The sum of the ethnographic evidence indicates that the project area was occupied by the Southern Miwok in the historic period, and the presence of BRMs and cobble pestles would support this contention. The occupants could have been Yokut also, and such artifacts as bowl or portable mortars would be expected. The Miwok also used the bowl mortar, but they claim they did not make them and they were not used for the processing of acorn (Barrett and Gifford and Gifford 1933:209).

There are three historic sites (CA-Mer-247, CA-Mrp-594 and -595) and one historic structure associated with a prehistoric site (CA-Mrp-592). CA-Mrp-594, the fence line with the associated structure, may be related to the known sheep-raising activities commencing with the 1850s and persisting until the early twentieth century. CA-Mrp-594, and -595 are collapsed structures along the upper portions of Burns Creek in the project area and the historic research has not been able, as yet, to isolate any possible early ranchers, miners or settlers who lived in those vicinities. The amount of mining activity evident from an examination of Burns Creek in the upper region suggests that the structures may be associated with early mining. Most of the land is known to have been used for large-scale ranching by the 1870s, and the structures likely predate that period. They do not appear to be line cabins, as they are not near property lines.

The historic graffiti site (CA-Mer-247) apparently represents the inscriptions of cowboys who worked the area during

at least a hundred-year period. They began in 1853 and extend to 1970. It is tempting to view the AW and EW inscriptions from 1906 as representing the Waltz Ranch except they did not lease from Grade until 1908, two years later.

The historic foundation associated with CA-Mrp-592 is located one mile north of the Waltz Ranch, which is known to have been occupied by John Bennett in the late 1860s and early 1870s. He is listed as having another adobe structure on his ranch located a mile north of his ranch. This is the approximate locale of the structure, and it may in effect represent this outlying building. Since it was an adobe structure, any further work considered for the structure should be oriented toward determining if CA-Mrp-592 was of adobe construction. It is outside the gross pool; thus, no work is recommended as part of this project.

The archeological evidence is not sufficient to attribute ethnicity to the Upper Emergent Period occupations in the region as yet, although Yokut has been suggested. Further archeological investigations are needed to be undertaken within the context of some well-constructed research questions and articulating methodologies to test the above hypothesis, as well as those presented earlier.

IMPACTS

Borrow areas.--The major impact to resources in the proposed reservoir area will be due to the construction of the dam itself. This includes the construction activities associated with preparing the access roads, the base of the dam, and the spillway. These features of the dam construction are comparatively limited in areal extent and, except for sites which are located where a structure is planned, effects will be minimal. The dam however is to be of earthfill construction. The borrow areas from which the construction materials are to be drawn are within the confines of the proposed reservoir. The raw material to build the dam will be derived by bulldozing or stripping off desirable raw materials over a comparatively large areal extent. In Burns Reservoir, the North Merced Gravels are one of the more desirable raw materials and the scraping of the terrain in front of the dam will encompass a moderately large area. The effect on sites within the borrow areas will be total destruction (Map 4).

The destruction of the sites within the borrow areas can be avoided if a strip surrounding them is left undisturbed. This buffer should be sufficiently wide that the soil stabilizing procedures planned (contouring, covering with top soil, and seeding) can be accomplished without impacting the site (see U.S. Army Corps of Engineers 1981:89 for information on soil stabilization). The construction equipment should not cross the sites while conducting the stabilizing procedures.

Inundation.--The damages to cultural resources, due to fresh water flooding, have been of concern for a long time but became a major topic in the 1970s. In particular, the National Park Service has undertaken research on this topic under the Reservoir Inundation Studies project (Carrell, et al. 1976; Lenihan et al. 1977), and other projects have been conducted within the same guidelines (Padgett 1978).

The major impacts can be divided into chemical and mechanical impacts. The chemical effects on the soil constituents and the various artifactual categories, facilities, and ecofacts are primarily due to immersion and its consequences. The short-term periodicity of the flood water levels in Burns Reservoir would likely have lessened the chemical impact of inundation.

The mechanical effects are primarily due to the wave action zone, which erodes the soil in the process of cutting benches. Other mechanical impacts of less importance in the project are "freeze-thaw, liquefaction, desiccation alternating with inundation, and siltation" (Carrell et al. 1976:19). Again, the short periods of inundation would preclude much damage due to these other factors, except perhaps for the effects of the alteration of wetting and drying due to inundation. Moreover, the effects of these other factors are less well known than the impacts of wave action since the results are not so observable, particularly in ungated dams of the sort used for flood control.

Specific Impacts

Borrow areas.--The borrow areas for Burns Reservoir are shown on Map 4. They encompass a fairly large area behind the existing dam as well as several lateral extensions, both upstream and downstream from the dam, at the base of the hill which forms the right dam abutment. A small part of the downstream channel to the southeast is also included. The northernmost extension of the proposed borrow areas does not reach any of the midden or historic sites. The borrow areas do, however, encompass one isolated bedrock mortar locus (CA-Mer-245) and a large lithic scatter (CA-Mer-251), and are sufficiently close to a petroglyph site (CA-Mer-52) to suggest probable impact due to the ground tremors caused by heavy earthmoving equipment (Map 4).

The bedrock mortar locus and the lithic scatter (CA-Mer-245, -251) will be completely destroyed by borrowing operations. Their preservation can be achieved by leaving an undisturbed strip around them and then stabilizing the scarp created. CA-Mer-52 will not be directly affected by excavation of the borrow areas; however, direct impact due to spalling of the rock face is a definite possibility as a consequence of ground tremors caused by heavy earthmoving equipment. Examination of the earlier recording of CA-Mer-52 by Mohr (see Heizer and Clewlow

1973, Figure 84a,b,d), in comparison to Peak and Associates' present recording, has revealed that some of the motifs have been affected by spalling. Further spalling due to induced ground tremors is thus a distinct possibility.

Inundation.--The estimation of the level of impacts due to inundation is a fraught-filled endeavor, because there have not been any studies undertaken on the impacts to be expected from periodic inundation. It is known from the records maintained by the Corps of Engineers on the present Burns Creek Dam that some water is present behind the dam during some part of the winter season. The impacts to be expected will depend on how often and how long the resources will face wave action and inundation. Reasonably it can be expected that sites located at the lower elevations will face relatively more impacts since the rainfall needed to raise the water level height enough to impact them will be less than needed to raise it high enough to impact the resource at the highest elevation (Map 5).

To provide a relative measure of projected impacts, the Corps of Engineers has provided a table of probability estimates for six zones of 10 feet each, which have been arbitrarily defined. It should be borne in mind that these are probabilistic estimates based upon the chances of the water raising to any one elevation during any one year. The first column represents the probability that the water will rise to levels within the zone. The second column displays the approximate number of days the water will be within the zone for the corresponding probability.

Figure 2 simply demonstrates the obvious, that the resources located in the lowest zone stand a high probability of being impacted during any one year than those above 295'. Below 295' there is a comparatively flat terrain, with gentle slopes on hillocks and creek banks. The mechanical effects of wave action would have played only a small role here due to the periodicity of its occurrence--i.e., standing water will not stay at any one level sufficiently long to create a wave-cut bench. There were certainly no clear wave-cut benches observable on the terrain in this portion of the reservoir. This is not to suggest that impacts have not occurred. The higher elevations in the reservoir, especially in the upper drainages of Burns Creek and the unnamed tributary which flows from the old Waltz Ranch, would logically have sustained more mechanical impacts due to wave action, since the slopes are steeper. However, as a mitigating factor, the resources in the zone would have been flooded less than the lower elevations and the mechanical effects of wave action would be commensurately less.

Figure 2

Zone (elevation in feet)	Probability (percent)	Duration (days)
265-275		
H	90	1
L	20	30
275-285		
H	16	1
L	12	30
285-295		
H	40	1
L	9	30
295-300		
H	20	1
L	6	30
300-310		
H	10	1
L	3	30
310-320		
H	2	1
L	.5	15

(The probability and duration are based on an average for each zone.)

Elevation: 265'-275'.--There are four sites located within the elevation zone from 265' to 275'. Two are bedrock mortar loci unassociated with cultural deposits (CA-Mer-245 and -251). Inundation will not impact them to any significant degree except perhaps by eventually burying them under the dam's buildup of bottom silt.

There is one midden site, CA-Mer-241, in this zone which will likely be impacted. It will undoubtedly face some impacts due to wave action, especially since it is exposed, with moderately steep banks on two sides. It is situated at the confluence of Burns Creek and an unnamed tributary which flows in from the east. The water level will be near it or on it almost every time there is a measurable amount of standing water behind the dam, and erosion on the creek sides of the site due to wave action is probable. The present dam may already have commenced the erosion since there is a small terrace on the creek side of the site which has resulted either from wave cutting or from erosive high-water creek flows.

CA-Mer-252 is a large lithic scatter with an associated bedrock mortar just upstream from the dam. It will be strongly affected by inundation since even the smallest inflow will submerge it. However, it is a very sparse scatter and there is a real possibility it was destroyed as an integral entity by the construction of the present dam. Little further impacts of a deleterious nature are foreseen since it has already been effectively destroyed.

Elevation: 275'-285'.--The sites located within this zone of intense wave action impacts are CA-Mer-52 and possibly the higher portions of the bedrock mortar locus, CA-Mer-251, discussed earlier. The only site which will be severely impacted by inundation in this zone is CA-Mer-52, a petroglyph site which has undoubtedly faced periodic inundation within the pool behind the present Burns Dam. As discussed earlier, several of the motifs drawn earlier by Mohr in the late 1940s have been spalled off its vertical face. This periodic inundation, followed by cold frosty days, will gradually break down the surface of the rock face by the wet-and-freeze process. The fallen pieces could not be seen on the nearby ground, but siltation buildup may simply have buried them, or they may be in unrecognizable fragments. There is no evidence to suggest vandalism as the means of removal of some of the panels (Figure 2).

Elevation: 285'-295'.--There are four sites which will be impacted within this zone: CA-Mer-76, -80, -79, and -247. The two midden sites, CA-Mer-76 and -79, are both large, essentially flat sites located along Burns Creek. The angle of the rising water and their flattish terrain indicate that wave-cut benches on their surfaces will not be easily formed, especially given the periodicity of the inundation. Those portions of the middens that face the creek will bear the brunt of the erosive effects of wave action. CA-Mer-76 is bisected by Burns Creek and a small tributary. During a rapid change of water level, its creekside deposits will likely undergo some erosion. On the other hand, the midden is covered with grass, which should stabilize it to an extent. It is certainly difficult to see any major effects of erosion at this time. The periodicity of the inundation suggests that, in the short term, the effects will probably be minimal. However, the long-term effects of periodic inundation are unknown, but some damage will undoubtedly be sustained by deposits.

CA-Mer-79 has a steep bank and the rising and falling water levels will undoubtedly erode this portion of the site since the steep angle between the water level and the terrain at this point allows maximum erosion by wave action. At present, this site receives impact only where the reservoir is at maximum pool. However, the increased height of the proposed dam will increase the duration of its inundation and its exposure to the rising and falling water levels. In short, the wave action will undoubtedly erode the exposed vertical bank of the deposit. The extent of the damage cannot be assessed at this time because of the lack of comparable studies. The possible wave-cut bench on CA-Mer-241 suggests there will be significant damage over the long term.

The lithic scatter comprising CA-Mer-80 will not be affected drastically by the rising and falling water. There will be movement of artifacts due to the undermining of deposits under them and by direct wave action. The extent of possible artifact movement cannot easily be addressed at this time due

to lack of comparable studies, but it obviously must occur to some degree.

CA-Mer-247, the historic graffiti site, will face the wet-and-freeze process CA-Mer-52 has faced for 50 years. Since the graffiti are carved into less consolidated rock, the pace of the damage will be increased.

Elevation: 295' Gross Pool.--There are seven sites located within this zone. Three are midden sites associated with bedrock mortar loci (CA-Mer-253 and -254, CA-Mrp-596), two are bedrock mortar loci (CA-Mrp-592 and -593), and two are historic sites (CA-Mrp-594 and -595). In addition, there is a structure associated with the BRM locus at CA-Mrp-592.

All three of the midden sites are located at the very edge of the gross pool; thus, sustained damage due to wave action will be minimal. The majority of CA-Mer-244 lies outside of gross pool, and the small midden associated with CA-Mrp-596 is also above gross pool. Little or no impacts are foreseen for these two middens. The midden associated with CA-Mer-253 is located on the flat just above the creek, and during a high flood stage that fills the reservoir to gross pool it will be impacted. The midden is slightly sloping to the creek and is plowed regularly. Wave action erosion will be minimized. The frequency with which gross pool is reached is an important point which cannot be assessed at this time. An examination of the previous 50 years of inundation behind the present dam suggests it may have occurred three times in that period. Given the relatively short duration of the pool at this level, erosive impacts will be minimal although some will occur.

The structural remnant at CA-Mrp-593 has already collapsed and little further damage will be sustained by it. The structure associated with prehistoric site CA-Mrp-592 is high enough up the slope to be protected from impacts. The structure associated with the rock walls on CA-Mrp-594 is also above gross pool and will sustain no other damage due to inundation.

The BRM loci, CA-Mrp-592 and -591, have already been studied, mapped, drawn, photographed, and measured. Little further impacts to them are foreseen in any event.

EVALUATION OF SIGNIFICANCE FOR THE NATIONAL REGISTER

The judging of the criteria for evaluating potential entries for nomination to the National Register of Historic Places depends upon the assessment of the resources "quality of significance" (National Park Service 1977:6). These potential entries must possess integrity of location, design, setting, materials, workmanship, feeling and association. In addition, potential entries

must be associated with one or more of the following criteria:

1. They are "associated with events that have made a significant contribution to the broad patterns of our history."

2. They are "associated with the lives of significant persons in our past."

3. They "embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that represent a significant and distinguishable entity whose components may lack individual distinction."

4. They have "yielded, or may be likely to yield, information important in prehistory or history."

Assessment of the significance of these sites will be based upon the above criteria. As the majority are prehistoric resources, the latter criterion will be used to justify their significance. The historic resources will have to be judged by the other criteria as well.

The significance of a resource, especially in the context of the informational limits of a cultural resource survey (in contradistinction to archeological excavation and analysis) is based upon the potential of the resource to address the pertinent research questions for a locale, as well as those of general anthropological or historical interest. The research design presented by Peak and Associates, and the results of the further investigations by the ethnohistorian and historian, will form the basis for evaluating the significance of the resources. The reader is referred to the summary and survey findings.

It must be borne in mind that particular prehistoric and historic research in the project area and the immediate environs has been minimal. The principal work was done by (Clewlow 1976), wherein they partially surveyed seven extant or proposed flood water dams and reservoirs, four of which were resurveyed during the performance of this contact.

Six of the recorded sites at Burns are middens, five occur with BRMs (CA-Mer-253, -241, -76, -244, and CA-Mrp-596), and one without (CA-Mer-79). The sites are large, in excess of 100m in their longest dimension, except for the small relic midden at CA-Mrp-596. They range in depth from 50cm to more than 100cm (CA-Mer-253). The soils are all dark due to high organic content, but are not ashy. The associated artifacts are bowl mortars, cobble and (perhaps) shaped pestles, core scrapers, flake scrapers, manos, metates, and some chiastolite crystals. The raw materials observed in the midden are basalt, metavolcanics, silicates (including petrified wood, perhaps from the Mehrten formation), and obsidian. The latter is an obvious import. Others may be also, but this is not yet

TABLE 2

RECOMMENDATIONS FOR NOMINATION

Site	Type	Condition	Research Potential	No Further Research	Research Recommended	Recommended for National Register
CA-Mer-52	P	deteriorating	High		X	Yes
CA-Mer-76	M	good	High		X	Yes
CA-Mer-79	M	good	High		X	Yes
CA-Mer-80	L	good	Low		X	No
CA-Mer-241	M	good	High		X	Yes
CA-Mer-244	M	good	High		X	Yes
CA-Mer-245	B	good	None	X		No
CA-Mer-247	H	good	Medium		X	No
CA-Mer-251	B	good	None	X		No
CA-Mer-252	B/L	destroyed	Low	X		No
CA-Mer-253	M	partly disturbed	High		X	Yes
CA-Mrp-591	B/P	partly disturbed	Medium	X		Yes
CA-Mrp-592	B/H	partly disturbed	Low	X		No
CA-Mrp-593	B	good	Low	X		No
CA-Mrp-594	H	good	Medium	X		No
CA-Mrp-595	H	good	Medium	X		No
CA-Mrp-596	M	good	Medium	X		No

Legend -- Site Types: B = Bedrock Mortar; M = Midden;
L = Lithic Scatter; P = Petroglyph;
H = Historic

established. The surface distribution of artifactual material is usually quite sparse, although CA-Mer-79 produced 15 artifacts from a 10 x 10m surface unit. They probably date from the Upper Emergent (post A.D. 1500), but before the Historic (A.D. 1850). They are in reasonably pristine condition, since the historic research indicates the area has been primarily range land from the commencement of historic settlement and not farm land. Away from the creek, the destruction due to mining is non-existent.

The surface examination of the sites, as well as the augering did not produce any evidence of faunal or botanical remains. Whether this is a real lack or simply a result of the sampling or augering procedures cannot be established without a test excavation, with screening and flotation.

The artifacts on the surface, the probable subsurface artifacts (if there is fire-cracked rock present, then tools and debitage will undoubtedly also be present), and the size of sites, in conjunction with their depth, suggest base camps, whether temporary or permanent. All have the potential to contribute to all of the proposed research questions, as well as others. This portion of the valley, bordering the valley floor and the foothills, offers several possible settlement systems. First, are they permanent villages with associated task-specific loci around them? This is the least likely hypothesis, given the summer aridity. Second, are they temporary camps of a seasonal nature of groups whose major villages are located along the Merced or San Joaquin rivers? Third, are they seasonal camps of groups whose main villages are in the foothills? For example, do the major sites along Bear Creek, recorded during the survey, constitute the permanent villages?

It is not known with any certainty what ethnographic group resided in the project locality. The artifacts observed, and the presence of cultural deposits suggests that with a careful analysis and an appropriate research design and strategy, we can help address this research question of some importance.

The low amounts of lithic debitage and debris, in general, and of obsidian, in particular (see Conclusions), suggests Yokuts. The Yokuts' lifeway was very early disrupted by the missionization process and the resultant introduced diseases, and we know little concerning it.

There are six BRM loci located within the project area (CA-Mer-251, -245, -252, CA-Mrp-592, -591, -593). The majority are located in contexts which suggest earlier mining operations may have destroyed associated middens (CA-Mrp-591 is a case in point). Comparatively few of the mortar holes are shallow, and some duration and consistency of occupation is indicated by all observed.

These bedrock mortar loci formed a part of a settlement system, or systems, and when studied in conjunction with the above midden sites, and the sites located in the Bear and Castle reservoir areas, their role in the settlement system of the region can be ascertained. The prehistoric petroglyph sites, CA-Mer-52 and CA-Mrp-591 are two of the few known petroglyph sites in the region prior to the intensive cultural resourse survey by Peak and Associates. Heizer and Clewlow (1973:26) specifically exclude the Merced county sites from any particular art style since, at the time, the sample was too small to judge their relationships.

The previous discussion and the conclusion chapter have demonstrated the research potential and, therefore, the significance of the midden sites along Burns Creek, especially CA-Mer-76, -79, -244, -241, and -253. CA-Mrp-596 is badly disturbed and it will be considered separately with the disturbance in mind. The significance of the above resources can be summarized as follows.

First, the midden sites along the lower stream reaches, within the project area, are in a reasonably undisturbed condition. The historic appendix reveals the area was very early devoted to livestock raising rather than farming; thus, the disturbance due to plowing and the levelling of sites prevalent elsewhere has not occurred. The augering and surface examination has determined all four have deposits exceeding 50 centimeters, and some have more depth. The augering did not produce any artifacts, but the amount of fire-cracked rock found, indicates a relatively high artifact content will be present when larger units with screening are utilized. The preservation of ecofactual material and radiometric datable samples could not be ascertained within the limitations of a survey, but the presence of a burial at the nearby site of CA-Mer-228, near the proposed Haystack Reservoir and in a similar situation, indicates good preservation of faunal and macrobotanical remains is possible. They have the integrity of deposits and the probable preservation to address research questions generated from the four major research domains or concerns presented in the research design.

Second, the middens are located on the valley floor at the edge of the foothills in a region whose occupation in the late prehistoric period is debated (see Appendix 1). The sum of the ethnohistoric evidence suggests Southern Sierra Miwok, but as the previous discussion and the conclusion chapter make clear, the archeological evidence indicates the late occupants could have been Yokuts. The massive depopulation of the groups on the valley floor by introduced diseases, especially malaria, may have destroyed the Yokuts, and the Miwok simply moved into and claimed the abandoned lands. If Moratto and Riley (1980) are correct that there was a late expansion of the Miwok to the south, then the replacement of Yokut by Miwok in the project area occurred earlier. The middens are situated in an area where both ethnographically and archeologically little is known. The

artifact content does not, from an admittedly surface examination, appear similar to the inferred Miwok occupation along the Chowchilla River to the south (Moratto 1972), and such contrasts need to be pursued.

Third, the conclusion chapter presents three possible settlement patterns in which middens may have articulated. Are they the permanent villages of groups who move seasonally in the summer and fall into the foothills? Are they the winter/spring temporary villages whose main villages are along the rivers in the interior of the valley? The San Joaquin Valley is often foggy and damp in the winter and the groups may have moved to the valley edge during that season. Are they the temporary villages of groups whose main villages are in the foothills and who move into the edge of the valley floor to exploit the fish, game, and waterfowl which abounded there? The determination of which settlement pattern they articulated, is a question of significance to prehistory, since except for the investigations along the Chowchilla River, little systematic archeological investigations have been undertaken in this part of the San Joaquin Valley.

Fourth, a village community organization, as defined by Moratto (1972) is indicated, but with some notable differences. The size and the 100+ bedrock mortars at CA-Mer-76, suggest it is the main village, the village community center where the chief resided (Moratto 1972). The other middens are the satellite large and small villages. The isolated bedrock mortar loci are smaller activity areas or campsites. The association of these sites with CA-Mer-52 and CA-Mrp-591 upstream, both petroglyph sites, suggests a community organization of some complexity. When viewed in comparison with the settlement pattern delineated along the Chowchilla, several points stand out. First, the Burns Creek sites lack housepits, a necessary attribute in Moratto's definitions of settlement types. The relatively undisturbed nature of the site indicates this is not a matter of destruction. Housepits are found along Bear Creek, adding more complexity to the settlement systems in the region. Second, they are closely associated with petroglyph sites, a situation even more marked along nearby Bear Creek. This stands in contrast to the settlement system along the Chowchilla River, where the nearest petroglyph loci, excluding cupules, is miles away (Moratto 1972:168). CA-Mer-52 is located next to a standing pool, even in the summer, a similarity to those along Bear Creek and again a comparatively unique situation. And fifth, while no burials were found during the survey of the proposed Burns Reservoir Project area, a burial was found during the survey of the proposed Haystack Reservoir. Both reservoirs are in the same environmental setting, and the same level of preservation can be expected at the midden sites in the project area. In consultation with concerned Native American groups, much demographic information can be derived from the examination and study of burials, not easily derived elsewhere.

In summary, the integrity of the five midden sites, the still undeveloped state of the research in the region, their obvious social relationships, the associations with ceremonial loci are all factors pointing to their significance for the prehistory of the region and for California in general. With these points in mind, CA-Mer-76, CA-Mer-79, CA-Mer-241, CA-Mer-244, and CA-Mer-253, should all be nominated to the National Register of Historic Places. The other midden, CA-Mrp-596, because of its disturbed nature, should not be considered for nomination at this time. If further investigations reveal it has a significant amount of undisturbed deposits left, then nomination should be reconsidered, since it shares much of the potential of the other midden sites.

The bedrock mortar loci have been studied and recorded as adequately as is possible, given practical investigative techniques, and further work on them will likely not yield information "important to the prehistory" of the region. They are important in the context of the settlement pattern for the region.

The petroglyph sites, CA-Mer-52, and CA-Mrp-591, should be nominated to the National Register of Historic Places. Petroglyph sites are comparatively rare in the Sierra Nevada, and especially in the lower foothill valley edge region of the San Joaquin Valley; and this very rarity makes them significant. They offer one of the few lines of evidence by which portions of the ideological elements of extinct human cultures can be studied.

The ethnohistoric research did not produce any locales, features, or sites considered important in the traditional Native American belief system, and thus no nominations within this criteria need be considered. There are no Native American communities left who historically resided within the project, either Miwok or Yokut and this, of course, is the major limitation to ethnohistoric research in this region of the valley floor.

CA-Mrp-592, as well as CA-Mrp-594, are foundations or collapsed stone-built structures probably related to the sheep raising which occurred between 1850 and 1900. The foundation at CA-Mrp-592 may be the remains of an adobe structure belonging to John Bennett in 1874. John Bennett was an important landowner or investor in the region in the 1860s and 1870s, but it is doubtful he qualifies as a "significant" person in California or national history. In any event, the structure was not the ranch but only an outlying building. We do not recommend the structures' nomination to the National Register of Historic Places; nor do we recommend the nomination of the other historic collapsed structures of CA-Mrp-594 and CA-Mer-592 for the same reason, since neither meet any of the criteria for nomination, at least at this time. CA-Mer-247 is also not recommended for nomination to the National Register at this time since it does not meet any of the criteria. If further archival research indicates the initials belong to a significant person in our history, then its nomination should be reconsidered.

We believe at this time, that the five midden and two petroglyph sites are the only resources that should be considered for nomination to the National Register of Historic Places.

All of the prehistoric sites probably formed part of the same settlement system, but this has not been proven to a sufficient degree at this time. The field effort proposed for the Phase 1 of the archeological investigations of the Merced and Mariposa County Streams project should provide the evidence to indicate how the resources are related. If investigations indicate the resources are the material remains of a distinct social system, then they should all be combined and nominated as a district.

MITIGATION/PRESERVATION ALTERNATIVES

The erosive effects on cultural resources of long-term inundation are well established by the studies undertaken by the National Park Service (Lenihan et al. 1977). However, the effects on resources in the periodic flood pools of ungated flood water dams, have not been studied, as far as we know at this time--especially the long-term effects. In order to deal with this problem, we have presented in Table 1 the probability estimates for levels of inundation that could occur during any one year. We established four water-level probability estimates for those zones to be inundated (Table 3).

Where a data recovery program is proposed for the prehistoric resources, we suggest a two-phase effort. The first phase will be a limited testing program to determine what subsurface evidence is present (artifacts, features, faunal and macrobotanical remains, radiometric datable material). The purpose of the Phase 1 effort is to provide sufficient information so a realistic data recovery program can be formulated for a Phase 2 mitigative effort. The sample size needed to achieve this goal is another problem.

The number of units needed to provide a sample adequate enough to demonstrate the artifact density(s), features, spatial activity areas, depositional complexity for a limited testing effort has not been the object of much sampling theory. Sampling theory has generally focused upon problems of regional sampling strategies and sample sizes needed to adequately demonstrate the variability of the populations tested. Such studies do not usually provide guidelines to indicate what sample size(s) is required to sufficiently reveal the internal complexity and artifactual variability and density of a site.

Ammerman et al. (1978) have recently presented a provocative study, which can be used, to indicate a probable range of effort for the limited testing of a site. Their report was a computer simulation study which tested the efficacy of different sampling strategies (random and non-random) and different sample

TABLE 3

MITIGATION RECOMMENDATIONS

Elevation	Site	Type	Area (M^2)	Borrow Impacts		Inundation Impacts		Comments
				Alt. #1	Alt. #2	Alt. #1	Alt. #2	
265	CA-Mer-245	B		None	None	None	None	
265	CA-Mer-252	L	20,000	None	None	None	Collecting on surface	
275	CA-Mer-251	B		None	None	None	None	
275	CA-Mer-241	M	3375	None	None	None	Testing $4M^2$	
225	CA-Mer-52	P			See Comments		See Comments	See Appendix
285	CA-Mer-76	M	22,500	None	None	None	Testing $22M^2$	
	CA-Mer-247	P/H		None	None	None	Archival research	
295	CA-Mer-79	M	4800	None	None	None	Testing $5M^2$	
295	CA-Mer-80	L	2200	None	None	None	Mapping, Artifact Collection	
295	CA-Mer-253	M	5250	None	None	None	Testing $5M^2$	
295+	CA-Mrp-596	M	4500	None	None	None	None	
295+	CA-Mrp-592	B/H		None	None	None	None	
295+	CA-Mrp-591	B/P		None	None	None	None	
295+	CA-Mrp-594	H		None	None	None	None	
295+	CA-Mrp-595	H		None	None	None	None	
295+	CA-Mrp-593	B		None	None	None	None	
282	CA-Mer-244	H	13,500	None	None	None	None	

Legend -- Site Types: B = Bedrock Mortar; M = Midden;
L = Lithic Scatter; P = Petroglyph

sizes. Their known population was an abandoned Masai kraal which had been carefully mapped, and all artifacts plotted by provenience. Their results were varied, but two are of import here.

First, sample units should be small for any given sample size--i.e., it is better to use many small units than a few large ones. Second, an effective sample size ranged from three to fifteen percent. Above fifteen percent, the sample size has to be drastically increased to produce significantly more predictability. Below three percent, it is difficult to predict within an acceptable level of tolerance, the variability and complexity of the site. We are discussing here data recovery required to fully reflect the variability of a resource.

For a limited testing of a site, we propose a fixed .01 percent sample size, or an approximation. If a sample size as low as three percent can achieve an acceptable level of predictability, then a .01 percent sample size should be sufficient to provide a basis to judge what sample size will be needed for predictability. Rondeau (1982:2) used .06 percent test sample by area on CA-Nev-199, which is comparable in size. The test revealed the approximate age of the sites deposits, as well as other important aspects, all confirmed by Rondeau's Phase 2 and Phase 3 effort. We suggest that sample sizes by area of less than one percent can be effectively used if placed properly in a limited testing situation.

CA-Mer-252, -245, -251, -241

CA-Mer-252.--This large lithic scatter associated with a BRM locus behind the extant dam has probably already been destroyed by dam construction. The surface artifacts are probably out of context. Little further damage is foreseen. The site should be carefully surveyed and all artifacts found on the surface collected without provenience for comparative purposes.

CA-Mer-245, -251.--The two BRM loci in this zone will not undergo any more disturbance due to inundation. CA-Mer-245 is located within the projected borrow pit area. Both have been mapped, and mortar holes have been measured, photographed, and illustrations have been prepared. No other archeological work is necessary. They should be avoided if possible during the borrow pit operations.

CA-Mer-241.--The dimensions of this roughly oval midden site are 75m x 60m, or approximately 3,375m^2, allowing for a 25% reduction due to its shape. The midden depth is one meter in its central portion, and a possible house floor was found during the augering procedure. This site will face a 20 to 90 percent chance of inundation during any one of the wet seasons

months. It could be inundated for one to thirty days. Moreover, it has already received some impact due to inundation in the past if the terrace at the site is wave-cut. Some impacts to it by inundation would appear to be a certainty.

Alternative 1.--The best solution would be preservation. However, this is not possible in the present circumstance since the impacts caused by the present dam will continue. It might be possible to cap the site with earth or rock to provide some protection; however, the projected periodic inundation would cause erosion of the caping material, leading to eventual exposure of the site to the same erosional processes. The possibility of increasing the amount of Bermuda grass on it should be examined for its feasibility as a stabilizing agent.

Alternative 2.--The most viable technique for negation of adverse effect in this case appears to be data recovery.

We recommend a limited testing of four meters, which is .01 percent by area. The units will be non-randomly placed by the principal investigator to insure that all portions of the site are tested. We suggest one by one meter units be used for the limited testing, as Ammerman et al.'s (1978) study indicates smaller units are more effective. The possible structure will be tested by the excavation of a one by two meter trench on its edge to ascertain if a floor exists.

The total volume to be excavated is about $7.2m^3$, based upon an average midden depth of one meter, and the excavation of 20 centimeters into sterile soils.

CA-Mer-52

The petroglyph site of CA-Mer-52 will possibly be impacted by the scouring of the borrow area since the equipment to be used will undoubtedly shake the nearby ground extensively. A comparison of Mchr's earlier recordation of the petroglyphs reveals some panels have already been disturbed by spalling. Moreover, the repeated inundation the site undergoes each year must cause some damage, with a possibly accelerated rate through time. The panels have been adequately recorded and photographed by our survey. However, its probable slow deterioration indicates some measures must be taken to preserve the motifs in their present state before further damage occurs.

Alternative 1.--The best policy is preservation. In the present circumstance this is not deemed feasible since the existing dam causes seasonal inundation of the site and its consequent accelerated deterioration.

Alternative 2.--We recommend that latex impressions of all the panels be taken to form a permanent information base for future archeological research.

The panels are sufficiently small that the latex impressions can be feasibly undertaken, and casts prepared from them. We suggest that two pairs of casts be prepared, one to be sent to the Rock Art Center at the University of California, Los Angeles, and the other to an acceptable local museum.

CA-Mer-76, -79, and -80

These three sites lie in a zone of relatively moderate impact between 285' and 295'. Two (CA-Mer-76 and -79) are middens, and one (CA-Mer-80) is a large lithic scatter. The major impacts for the middens will be due to the erosive effects of wave action on the creekside edges of the middens. The three sites are presently on the very edge of the gross pool (290 feet elevation) on the existing reservoir, and no observable damage was apparent during our survey.

Alternative 1.--Preservation is, of course, the preferred alternative, but again it is not feasible since the sites are now within the gross pool of the present dam and any exposure to the wave action zone will be cumulative, especially on the unprotected creekside deposits.

Alternative 2.--The level of inundation impacts faced by sites within these zones is commensurately less than those down below. The probability estimates of Figure 2 indicate they face a nine to 40 percent chance of being inundated during any one year. Given the limited extent of our knowledge of disturbance to repeated but short episodes of inundation, as is the norm for ungated flood water dams, we would prefer an ongoing program of testing and evaluation of impacts. As the first stage of the program, a complete mapping of the sites with a transit and stadia rod should be completed. The map prepared should have 25cm contours to insure that future incremental disturbances will be perceivable. Mapping datums should be permanent. The creek banks should be carefully mapped. Preservation is, of course, the objective for those portions of each site which can be protected. The proposed limited testing program will be limited to those portions of the sites which will be the most impacted--i.e., the slopes which face the creek. Sample size is based upon the areal extent of each site and it falls into the .02 percent sample size by area. Within the zones of heavy impact it is, of course, a much larger sample size. The soils and their constituents should be studied by a competent, professional soil scientist or geomorphologist. The soil testing should include all feasible tests which are commonly undertaken. The goal will be to provide a basis to judge any future changes due to chemical alteration occurring from immersion. Excavation units should be so distributed as to distinguish any multiple-component or activity-specific loci.

For CA-Mer-76, which will face comparatively moderate impacts, we recommend the excavation of $22m^2$, a .01 percent sample by areal. These units should be placed on those portions of the midden that slope to the creek since that is where the most impact will occur. For CA-Mer-79, the same rationale is applicable and we recommend five 1 x 1m units placed along the edge where the impacts due to wave action will be the greatest. At CA-Mer-80, periodic wave action will undoubtedly cause artifactual movement of surface lithics. The site should be mapped with a transit and stadia rod, and a 25cm contour map should be prepared. The surface should be carefully examined, and all artifacts should be flagged, plotted on the map, and collected for analyses.

CA-Mer-253

This midden site is barely within the gross pool of the proposed reservoir. The portion of it which may be impacted is the flat, plowed area bordering the creek to the south which flows through the Waltz Ranch. The elevation of the site indicates it stands a very small chance of being inundated during any one year (.5 to 2 percent), and the possibility of impact is very low.

Alternative 1.--The best alternative would be preservation and, if the dam is not built, there would not be any impacts to the site due to inundation. The site is repeatedly plowed, so impacts are a continuing fact. Such disturbance will, in the long run, cause more disturbance than episodic inundation.

Alternative 2.--We recommend a limited testing program of five 1 x 1m units that will be excavated along the foot of the slope in the midden area within the proposed gross pool. This is approximately a .01 percent sample by area for the entire site ($5,200m^2$).

CA-Mer-247

The historic graffiti site on CA-Mer-247 will be inundated periodically by water, but only when the reservoir is nearly full. The impacts due to wave action and the resultant erosion can be considered small. The site can be considered to have met the criteria for the negation of adverse effect since their recordation has been completed. No further work is recommended, except for archival research to determine who carved their initials. The brands represented should be especially pursued.

Remaining Sites

The rest of the sites recorded during the survey will not suffer significant adverse impact as a result of this project. CA-Mrp-591, -592, -593, -594, and -595 are all located at or near the project "take line," but above gross pool and all are distant from construction or borrow areas. The project will not cause impact to these sites. CA-Mrp-596 does include a bedrock mortar locus within the creek; however, the major effect on this site will be the erosion of the bank site deposits.

The occasional inundation of the bedrock mortars will, in fact, slow down their destruction, since the rising pool will slow or prevent the current of the creek from continuing their erosion. No testing measures are indicated for any of these sites, since the survey methods were complete enough to qualify as sufficient to negate the criteria of adverse effect.

The large midden site of CA-Mer-244 is situated just above gross pool, and no impacts from inundation are foreseen. No further work is recommended for this site, unless the specifications for the dam height are increased, Preservation is again the best alternative.

In addition to the field effort, detailed analyses of the debitage, faunal material, botanical samples, possible human burials, and typological study of tools are necessary parts of the proposed limited testing program for all sites. The surface evidence indicates obsidian hydration and sourcing are also suggested lines of evidence. The probability of organic material suggests C-14 dating is possible.

PRIORITY OF MITIGATIVE/PRESERVATIVE MEASURES

The priority of the mitigative/preservative measures is again dependent primarily upon the degree of expected impact by either construction activity or inundation level. Impacts by the construction of the dam is regarded as the most devastating factor; therefore, the most critical. Such impacts will also precede the other possible impacts due to inundation. Any resources within the proposed borrow areas must be ranked as the most critical. Only CA-Mer-52,the petroglyph site, is placed in the most critical impact category due to the probable spalling from its surface of further motifs caused by ground tremors resulting from the operation of heavy equipment.

The less critical category includes all middens to be impacted by inundation between 265' and 295'. The effects on such midden sites by inundation are an unknown factor within the pool areas of ungated flood water dams. The very short term of

such inundation and the highly fluctuating water level, as well as the nature of the terrain and vegetation cover, must all minimize impacts, but to what degree is unknown. Certainly, within the confines of the present Burns Reservoir, little, if any, evidence of wave-cut benches can be seen. Thus, the impacts to these resources must be considered less critical than total destruction. The testing programs recommended vary with the expected level of inundation impacts, of course.

The least critical category is composed of those resources which cannot be affected by inundation, either because they have already been destroyed (CA-Mer-252) or by their nature are impervious to inundation impacts (e.g., bedrock mortar loci) or they are in the water level zone above 295' which is rarely ever impacted. Preservation is again the byword in this judgment. CA-Mer-247 is considered in the last critical category because it will rarely face wave action, and because its recordation has negated the "adverse effects."

SCHEDULING OF THE TEST PROCEDURES

The schedule for the limited testing program for the cultural resources to be affected by the expansion of the Burns Reservoir is predicated on the limited testing of four midden sites (CA-Mer-76, -79, -241, and -253), and the surface collection of two (CA-Mer-80 and CA-Mer-251). Some limited archival research will be undertaken concerning the graffiti on CA-Mer-247.

The testing rationale proposes a .01 percent sample of the areal extent of the midden suitable for testing (Table 2). Volume is calculated from the known or estimated midden depth at each site (Table 1).

The person-hours required to excavate the soil are calculated on the expected production rate with allowances for set-up time, profiling of unit side walls, and backfilling. Each site would require the preparation of a contour map by using a transit and metric stadia. The hours required for mapping are given in Table 7.

The crew would be composed of twelve archeological technicians under the direction of the field director and one crew chief. The proposed work would require the crew to be in the field for 16 crew work days or 3.2 weeks.

The draft report would be due three months after completion of all field work. This time period is required to complete laboratory work, analysis, graphics and write-up.

Special analysis may be required to produce the information for an evaluation of significance. Consultants will be retained where needed.

TABLE 4

PRIORITY OF MITIGATIVE/PROTECTIVE MEASURES

Site	Best Alternative	Degrees of Impacts
CA-Mer-52	Preservation	Critical
CA-Mer-76	Preservation	Moderately critical
CA-Mer-79	Preservation	Moderately critical
CA-Mer-80	Preservation	Not critical
CA-Mer-241	Preservation	Moderately critical
CA-Mer-244	Preservation	Not critical
CA-Mer-245	Preservation	Not critical
CA-Mer-247	Preservation	Not critical
CA-Mer-251	Preservation	Not critical
CA-Mer-252	Preservation	Not critical
CA-Mer-253	Preservation	Moderately critical
CA-Mrp-591	Preservation	Not critical
CA-Mrp-592	Preservation	Not critical
CA-Mrp-593	Preservation	Not critical
CA-Mrp-594	Preservation	Not critical
CA-Mrp-595	Preservation	Not critical
CA-Mrp-596	Preservation	Not critical

Lithic Analysis

A three-task effort is proposed for analysis of the lithic flaked component. Task A will be the overall analysis to distinguish the tools and debitage categories, the steps in the reduction process present, and measurements and observations designed to reveal them. Task B will be the microwear study of samples of tools and debitage. Task C will be the preparation of the report.

Task A.--The examination of the lithic flaked component will consist of identifying those artifact categories and attributes which best describe the lithic reduction process which formed the assemblage. The basic artifact categories are tools and debitage. Tools are classified as any lithic blank which has been so modified as to change its shape to some significant degree. The debitage categories recognized are those which reflect aspects of the lithic reduction process. A commonly used list consists of interior flakes, cortical flakes, core platform flakes, bifacial thinning flakes, hinge flakes, burin spalls, scraper retouch flakes, chips, chunks, and cores. Other categories can be used if deemed necessary, as well as the deletion of some of the above.

Attributes commonly recorded are dimensional measures, platform angles, number of dorsal scars, sometimes the dorsal scar patterns, types of retouch or preparation, edge angles, and other attributes which reflect the techniques and methods used. The attributal study will be undertaken on a randomly drawn sample of the population of each relevant artifact category.

Task B.--The microwear examination will consist of a systematic study, with a binocular microscope, of selected artifact categories for evidence of usage. The kinds of evidence usually recognized are abrasion, polish, crushing and striations. Their location on the working edge of an implement often reveals the kinematic movement of the tool during its functional use. An estimate of 30 minutes per artifact was used to project the time necessary for this task. This estimate agrees with that utilized by others as well as personal experience. A one percent sample of the debitage will be drawn and also studied for traces of wear and use.

Task C.--In addition to preparing a report on the above tasks, the interpretive results will be integrated with information from other aspects of the research program.

Obsidian Hydration and Source Characterization Analysis

Obsidian hydration dating can provide a diversity of information regarding archeological cultures. The two primary applications of the method are relative and chronometric dating. Relative dating can involve the testing of site stratigraphy, seriation of artifact forms with a stratigraphically mixed deposit, artifact reuse, and exchange. It can also provide a relative temporal ordering of sites within a given region so long as the obsidian source(s) hydrate at the same rate and environmental conditions remain relatively constant.

Chronometric applications normally involve the calculation of absolute ages in calendar years from obsidian hydration readings. This is normally based upon an empirically derived obsidian hydration rate curve, usually defined for a single obsidian source in a given environment on the basis of a series of obsidian hydration-radiocarbon associations. These associations should span the entire time range for human utilization of obsidian resources in the study area.

In addition, when combined with obsidian source characterization analysis, obsidian hydration dating can provide valuable diachronic information regarding prehistoric exchange systems within the study area.

Faunal Analysis

The analysis of the faunal material from a site can provide evidence concerning subsistence practices, buthering techniques, food preference, seasonality of exploitation, carrying capacity, and group size or duration of occupation. Faunal studies thus provides one of the more productive lines of evidence which can be pursued to reconstruct past lifeways.

C-14 Dating

The establishment of a chronology is a requisite part of any archeological investigation. C-14 dating is one of the more productive radiometric dating methods, and since any organic material can be dated, it is one of the more valuable tools in archeological studies.

Native American Involvement

In addition to the Special Studies (some may be optional), There is a need to have cooperation with the Native American people to insure protection of their heritage values. Although no members of the Indian communities who once resided in this region were identified, the prehistoric resources should be considered as important to other Native Americans. A consultant should be retained during the field excavations to provide

liaison with local Native American groups and with the Heritage Commission.

A field season, with a crew of eight, is projected for excavation, or 1,011 man/hours total with the collecting and mapping of the two lithic scatters included. Eight man/hours will be spent on archival research concerning CA-Mer-247. Latex impressions are to be made of the petroglyph panels of CA-Mer-52. The work will be undertaken by a consultant.

TABLE 5

Phase 1 Prehistoric Testing Procedures
Estimated Field Hours

Midden	Excavation/Collecting		Mapping
	m^3	man/hours	man/hours
CA-Mer-76	22	595	16
CA-Mer-79	5	141	16
CA-Mer-80		8	16
CA-Mer-241	4	115	16
CA-Mer-251		8	16
C_A-Mer-253	5	144	16
	36	1,011	96
TOTAL HOURS			1,107 hours

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PERSONAL COMMUNICATION

Pope, Joe L. Archeologist, State Water Resources Control Board

West, James, Archeologist, Bureau of Reclamation

GLOSSARY

ADAPTATION: Cultural developments by which a society relates successfully to its effective environment.

ALLUVIUM: Unsorted sediments (mixed silt, sand, gravel, cobbles, etc.) deposited by a stream.

ARTIFACT: Any product of human cultural activity (such as tools, weapons, works of art, etc.).

ARCHEOLOGY: The branch of anthropology devoted to the scientific study of past cultures through their material remains. Archeology seeks to describe and explain the nature and evolution of cultural systems.

BASALT: A dense, fine-grained, tough extrusive igneous rock; a common material in California lava flows. Indians chipped basalt into knives, points, scrapers, and other artifacts.

BEDROCK MILLING STATION: An outcrop of bedrock with one or more mortar cups, milling slicks ("bedrock metates"), gyratory mills, or other features related to food grinding or crushing.

BIFACE: Any stone artifact chipped on both sides or faces; most projectile points, knives, drills, etc., are bifaces.

BIFACE THINNING FLAKE: The convex-shaped flakes removed off a biface during manufacture or maintenance.

B.P.: Before Present; by convention, before A.D. 1950; often used in citing radiocarbon dates.

BLADE: A flake twice as long as it is wide, usually struck from a specially prepared core.

CARBON-14 (RADIOCARBON) DATING: A method for determining the age of organic material by measuring the extent to which the isotope carbon-1r (^{14}C) has decayed into stable nitrogen-14 (^{14}N), comparing the ^{14}c fraction with its known half-life of 5,568 ± 30 years.

CENTRAL SIERRA PETROGLYPH STYLE AREA: The central portion of the Sierra Nevada mountain range and adjacent foothills which includes all or part of Amador, Butte, Calaveras, El Dorado, Madera, Mariposa, Merced, Nevada, Placer, Plumas, Sacramento, Sierra, and Stanislaus Counties.

CHERT: A flint-like rock composed of chalcedony with variable amounts of clay and other impurities

CHOPPER: A large, usually crude, pebble, cobble, or core tool--typically percussion-flaked to form an axe-like cutting edge along part of the margin--used for various heavy chopping and cleaving work.

CIRCLE AND DOT: Petroglyph with elements of one, tow, or several concentric circles with a dot or sphere inside.

COBBLE PESTLE: A minimally shaped, naturally elongate, cobble intended for use in a bedrock mortar.

COMPLEX: A patterned grouping of similar artifact assemblages from two or more sites, presumed to represent an archeological culture.

COMPONENT: A site or a stratum within a site which represents the activities of one cultural group during a relatively brief interval of time. Similar components within a locality or region comprise a phase.

CORES: The lithic cobble, nodule, or prepared artifact from which flakes or blades are struck.

CULTURE: The non-biological and socially transmitted system of concepts, institutions, behavior, and materials by which a system adapts to its natural and human environments.

CULTURE HISTORY: The archeological sequence of cultural activity through time, either within a defined geographic space or with reference to a particular group of people.

CUPULE: A small, round pecked petroglyph.

CURVILINEAR: Free-form or geometric motifs consisting of wavy or non-linear elements joined by curves.

DEBITAGE: Lithic refuse or debris produced by flaked stone tool manufacture. An analysis of debitage can yield much information about technology, skills, and economic variables.

DEMOGRAPHY: The study of human populations with special reference to their size, density, composition, and distribution.

ECOFACTS: The faunal and botanical material carried into a site by the agency of man.

ETHNOGRAPHY: The direct anthropological study of living human groups or the indirect study of groups through interviews and archival research.

FACILITY: A large, complex artifact or part of a cultural site (e.g., a hearth, cairn, house remains, rock alignment).

EXCHANGE SYSTEMS: The trading networks through which goods are moved from one consumer group to another.

FIRE-CRACKED ROCK: Clastic rock fragments broken by heat from fires in the past.

FLAKES: The lithic artifact struck from a core.

FLAKE-SCRAPER: A small flake of stone used as a scraping tool; flakes may be retouched or used without such modification.

GRINDING SLICK: A smooth flat surface on a boulder or bedrock which has been used in conjunction with a mano to crush seeds and nuts.

HAMMERSTONE: A hard, tough, fist-sized rock used as a hammer to work stone, drive wedges, splinter bones, etc.

HEARTH: A feature consisting of ash, charcoal, burned rock, charred faunal remains, oxidized earth, and/or other evidence of fire kindled by humans.

HOUSEPIT: A depression of any shape representing the former location of a partly subsurface structure.

IN SITU: In place; a term applied to archeological phenomena which are found in their original, undisturbed position or location.

LANGUAGE FAMILY: A group of two or more languages that developed from a single ancestral language; the latter is referred to as the proto-language for that family.

LITHIC SCATTER: An archeological site consisting of chipped and, less often, ground stone artifacts and refuse distributed on or near the surface.

MANO: From the Spanish la mano ("hand")--a loaf-shaped hand-stone used for grinding seeds, pigments, etc., on a metate or millingstone.

METATE: From the Aztec metatl, a stone slab upon which corn and other grains are milled with the aid of a mano, which is used in a push-pull motion.

MIDDEN: A deposit, marking a former habitation, which contains such materials as discarded artifacts, bone and shell food refuse, charcoal, ash, rock, human remains, and structural remnants.

MITIGATION: Minimization; in colloquial jargon, the reduction of adverse effects to cultural resources by avoidance, data collection, or other means to preserve potential data.

MORTAR: A strong bowl-like vessel or receptacle in which substances are crushed or pounded with a pestle.

BEDROCK MORTAR: A mortar "cup" or pit in a bedrock outcrop.

BOWL MORTAR: A shaped stone bowl in which foods were processed.

COBBLE MORTAR: An unmodified cobble in which a mortar pit has been ground.

OBSIDIAN: Natural volcanic glass. This was the most prized material for chipped stone artifacts in California.

OBSIDIAN HYDRATION DATING: A method for determining the age of obsidian artifacts by measuring the thickness of a specimen's hydration "rim" (layer of water penetration) and comparing the rim depth with a rate for the particular climate/geographic area and type of obsidian being studied.

PALYNOLOGY: The study of fossil pollen for the purpose of reconstructing former vegetation assemblages and climatic conditions.

PESTLE: An elongate, often cylindrical, stone or wooden artifact used to pulverize food products and other stuff in a mortar.

PETROGLYPH: A design or motif pecked, scratched, or incised into the surface of a rock; unpainted "rock art."

PICTOGRAPH: A design or motif painted onto a rock surface; painted "rock art."

PHASE: A distinctive archeological unit representing a fairly brief interval of time within a locality or region. A phase may be a single component at one site or a prolonged occupation of numerous related sites (Willey and Phillips 1958).

PREHISTORY: The archeological record of non-literate cultures; the cultural past before the advent of written records.

PRESSURE FLAKING: The manufacture of stone artifacts through removing flakes by pressure applied with a bone, antler, or metal knapping tool.

PROBLEM DOMAIN OR CONCERN: A group of related questions or topics to be investigated, along with a discussion of possible ways to study them.

PROJECTILE POINT: A sharp stone or bone tip or point affixed to the distal end of a spear, lance, dart, or arrow.

RECTILINEAR: Angular elements of geometric or sub-geometric designs which consist of linear segments joined at angles.

RESEARCH DESIGN: An explicit, formal articulation of research objectives with a systematic plan for the recovery and analysis of data to achieve those objectives.

RESEARCH QUESTION: Particular hypothesis formulated to assess particular problems.

RESEARCH STRATEGY: The system of concepts by which a theoretical stance is related to a particular research design.

ROCK ART: Designs or motifs of art which are produced on natural rock surfaces. Includes petroglyphs and pictographs.

SAMPLE: Part of a whole; a collection of data taken from and representing a "statistical universe" (a larger body of potential data).

SAMPLING PLAN: The explicit procedures by which data are to be collected.

SCARP: A line of cliffs produced by erosion or faulting, such as the precipitously steep eastern wall of the Sierra Nevada.

SCRAPER: Any of the myriad tool forms used chiefly for such scraping functions as stripping bark, planing wood, removing scarf skin from hides, etc.

STERILE: Devoid of archeological material.

STRATIGRAPHY: The study of cultural and natural strata or layers in archeological and geological deposits.

TRADITION: A way of life or a consistent patterning of technology, subsistence practices, and ecological adaptation which persists through a relatively long interval of time.

TRAIT: Any definable element or aspect of culture suitable for comparative purposes.

TRANSHUMANCE: Patterned movement of people, such as the seasonal population shifts up- and down-slope in the Sierra Nevada.

VERNAL POOL: A pool habitat which may be loosely defined as a small depression, usually underlain by some subsurface layer which prohibits drainage into a lower soil profile, and thus forms a seasonal pool during the winter months.

BURNS RESERVOIR

List of Plates I through 5

A

B

PLATE 1

A

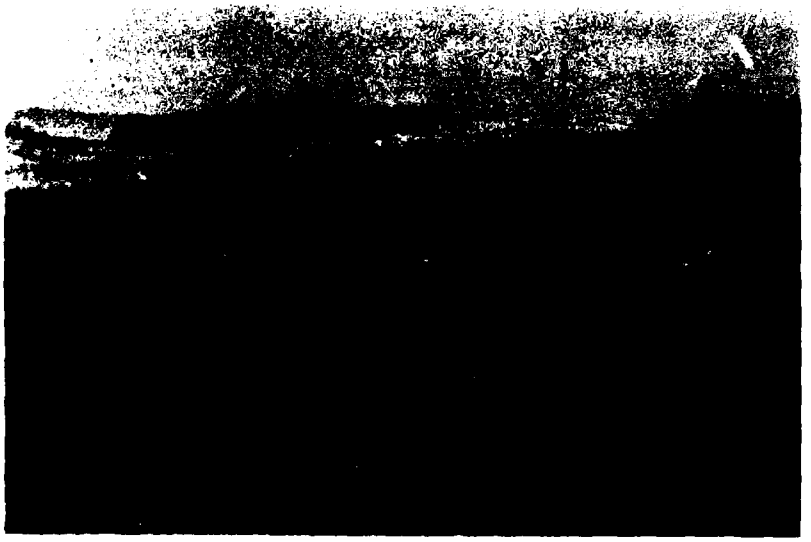
B

PLATE 2

A

B

PLATE 3

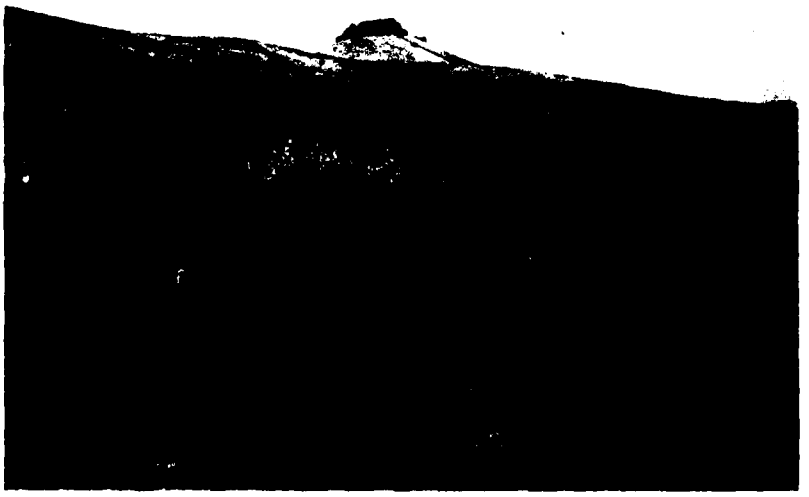


A

B

PLATE 4

A



B

PLATE 5

APPENDIX 1

ETHNOGRAPHY, ETHNOHISTORY, AND HISTORY OF THE MERCED COUNTY STREAMS PROJECT AREA

by

Jeanne Muñoz

with

Melinda Peak

INTRODUCTION

The Research

Standard ethnographic, ethnohistoric, and historic research was conducted to gather data for this part of the report. Published and unpublished documents, reports, records, and maps were examined at local institutions (libraries, historical societies, county offices); at California State University, Fresno (Woodward Special Collection); at the Stockton-San Joaquin County Public Library; at the California State Library, Sacramento; at the California State Historical Society Library, San Francisco; and at the Bancroft Library, Berkeley. Interviews were held with local historians, ranchers, Native Americans, and with professional colleagues with research interests and experience in the local area (see Appendix 2). Data were evaluated using standard criteria (see Haekel 1973).

Problems in Conducting the Research

Local data sources presented some very real difficulties. Research on the early years of Mariposa County was hampered by the lack of documents. The courthouse burned in 1854, destroying county records from 1849 to that date. In addition, a number of the early deed books are missing (Vols. E, F, H, I, J, K, L, and V). Tax assessment roll books begin in 1858 and have a continuous run from 1860 to the present. There are no map books to accompany the early records, and locational data are vague for the properties being taxed (a typical entry might be "Bear Creek"). Section and township information is first provided in 1871.

The Merced County Courthouse is currently undergoing interior remodeling, and the archival materials of the Merced County Historical Society, previously stored on the first floor of that building, have been removed to a storage facility and are inaccessible. Other county records (such as tax assessment

rolls) are in storage elsewhere, and keys to the storage facility are unavailable. The Historical Society's collection of prehistoric artifacts is also in storage. Access to these materials will not be possible before the first part of 1983.

There are a number of general histories available for Merced County (e.g., Elliott and Moore 1880; Outcalt 1925; Radcliffe 1940; Clark 1955; Graham 1957), and several particularized histories as well, such as the history of Atwater (Atwater History Club 1958), of LeGrand (Nolan 1972), of the Merced Irrigation District (McSwain 1978), and of Merced County schools and school districts (Merced-Mariposa Retired Teachers Association n.d.). There are no comparable general histories for Mariposa County, although a wealth of material exists on Fremont and there are a number of good accounts of the gold rush era (e.g., Collins 1949; Wood 1954) and on Yosemite. These sources, and material gained from interviews, were used to present a more complete picture than that afforded from primary archival data only.

Organization of the Data Gathered

The information gathered has been synthesized and is presented below in terms of historical themes.

EXPLORATION AND EARLY SETTLEMENT, TO THE 1840s

Exploration was minimal and had no great effect on the area other than the bestowing of such place names as Merced and Mariposa by the Spanish. The explorer Gabriel Moraga and his diarist Pedro Muñoz came through the area in 1806, failing to observe any Native American settlements. Other Spanish forays were made into the lower (or northern) portion of the San Joaquin Valley during the early part of the 18th century, and nearby Indians were removed to the missions. Land grants were made by the Mexican government in the 1830s and 1840s near, but outside, the Project Area. Jedediah Smith (and probably others) trapped furs in the 1820s and John Charles Fremont and Joseph Reddeford Walker explored in the 1840s.

NATIVE AMERICANS OF THE STUDY AREA

Identification of the Original Inhabitants

Anthropologists and ethnohistorians do not know with certainty the tribal identity of the early inhabitants of the Merced County Streams Project Area. No named villages are located within the Area (Kroeber 1925 Plate 37; Latta 1977 Endsheet; Levy 1978:400; Wallace 1978:462), and there is uncertainty as to tribal affiliation of some of the groups which

occupied nearby areas (Kroeber 1925:474). Merriam (1907) shows part of the area as Southern Miwok (Map 1), but Cook assigns the entire Project Area to the Southern Miwok (see Map 2).

Wallace (1978:462), on the other hand, assigns the downstream and plains portions of the area to the Yokuts, showing the Coconoon Yokuts on the north side of the Merced River, the Nopchinchi Yokuts on the west side of the San Joaquin River between the Chowchilla River and present-day Firebaugh, and the Chauchila Yokuts on the north side of the Chowchilla River. Kroeber states that the last-named group is "the last tribe (of Northern Valley Yokuts) until Stockton is reached, concerning whom anything definite is known" (1925:485). Personal extensive research (Muñoz 1976a, 1976b, 1980) and information from Castillo (1981), who has also conducted in-depth research on the area, does not support either Yokuts or Miwok occupation of the downstream and plains portion of the Merced County Streams Project Area during historic times; it does provide evidence of lack of occupation by any Native American group at least as early as 1806. (Archeological evidence may, of course, provide the necessary data to determine protohistoric occupation of the area; see Native Americans of the Project Area, below.)

It is possible that Northern Valley Yokuts occupied the plains and that Southern Miwok held the foothills of the area in prehistoric times, for Kroeber states, in a discussion of the western boundary of the Southern Miwok (1925:443) that

> . . . it has sometimes been assumed that the Miwok ranged as rightful owners over the whole eastern and more fertile side of the lower San Joaquin Valley, but the evidence is nearly positive that this tract was Yokuts, and that the precise commencement of the first foothills marked the boundary between the two stocks.

Native Americans of the San Joaquin Valley, 1800-1855

A brief review of the history of the Native Americans of the San Joaquin Valley between 1800 and the end of the gold rush may help explain the uncertainty of tribal occupancy.

The historic era in California is usually said to start in 1769 with the Spanish overland exploration/missionizing expedition of Portolá and Serra. The first contact with Native Americans of the Project Area did not occur until 1806, when Gabriel Moraga, with Father Pedro Munoz as his diarist, entered the San Joaquin Valley. The party camped on Bear Creek in Township 8 South, Range 10 East, on September 27 (Cook 1955a: 48), then explored to the north, discovering and naming the Merced and other rivers, returning south early in October. Cook (1960:284) notes:

> . . . Moraga's party stayed close to the eastern edge of the valley. On the seasonal streams found in this area (including, it is assumed, Black Rascal, Burns, and Bear creeks) there was a distinct absence of permanent Indian settlements.

Many villages were noted, however, to the north (Merced River and beyond) and to the south (on the San Joaquin). It is possible, of course, that unobserved villages existed, perhaps upstream from Moraga's route, hidden from view by the foothills. It is even possible that Indians from the general area were later taken to one or another of the missions, as it is known with certainty that Nopchinchi Yokuts immediately to the southwest were taken in (Castillo 1981).

If unobserved villages did exist, or if the Area was populated after Moraga and Muñoz came through, the population may have been wiped out in the epidemic of 1830-1833, when malaria spread from Oregon through the entire Central Valley (Cook 1955b). Cook (1955, 1978:92) estimates that from one half to three quarters of the total native population of the Sacramento and San Joaquin valleys may have died in this epidemic. Perhaps present-day eastern Merced and western Mariposa counties were particularly hard hit, and the Area was deserted by the survivors, thus explaining the lack of description of the local Indians by Anglo Americans.

During the gold rush the Indians in the general area were further decimated (by one means or another) beginning in 1849 and particularly 1850 and, as a result, a reservation system was authorized by the U.S. Congress in an attempt to protect both Indian and non-Indian. The first treaty signed by Commissioners Redick McKee, G. W. Barbour, and O. M. Wozencraft and the "chiefs, captains, and head men" of various groups of Indians established the Merced River Reservation between the Tuolumne and Merced rivers. The name of one of the tribal groups represented in the treaty--the Coconoon-- is described by Kroeber (1925:474) as uncertain as to its tribal affiliation, but is mapped by Wallace (1978:462) as a Northern Valley Yokuts group occupying the north bank of the Merced River near its juncture with the San Joaquin River.

The names of other groups in the treaty do not appear in modern anthropological literature (except for Hodge 1907-1910), although some appear in various ethnohistoric and historic accounts. The "Po-to-yun-te," for example, are called "potoyensess" by Ward in his 1851 account (Collins 1949:55-56), and are described by Ward as living near the trading post on the Merced River (close to present-day Merced Falls). In 1859, the Indian agent at the Fresno River Agency reported to the Commissioner of Indian Affairs that one hundred ten "Poto-en-cies" had "abandoned their native land, the Merced Valley and are now on the Chowchilla" (Lewis 1860). This is the location assigned them by Taylor on his map of 1864 (Heizer 1941).

Adam Johnston's map of 1852 shows "500 Indians" living on the "Merced River" (Map 3), but his accompanying report (Johnston 1853) does not provide locational data by tribal group or ethnographic description. Howard, in his reminiscences (Cossley-Batt 1928), provides ethnographic material, but mostly for Northern Miwok, even though he settled in Southern Miwok territory. Eccleston's diaries (1849-1854), written in the area, contain important ethnographic details, but tribal affiliation (other than either Yokuts or Miwok) is uncertain.

In sum, there are inadequate data to assign with certainty the Project Area to one or another specific Native American group. It may have been entirely Yokuts territory at one time, with Southern Miwok moving in after decimation and/or abandonment. The foothills may have been a transition zone, shared by both groups. Or the Yokuts may have held the plains, the Miwok the foothills. Or, more likely, it was unoccupied from some unknown time before 1806 until settlement by non-Indians.

Ethnographic Overview: Miwok and Yokuts

The sociocultural systems of the two groups which may have occupied the Area--the Miwok and Yokuts--were very similar (Gayton 1948:362), and it is therefore possible to describe accurately the putative aboriginal inhabitants of the Project Area even though their identification cannot be determined conclusively.

The Native Americans derived their subsistence from the abundant natural resources of the plains, foothills, and mountains (fish, game both large and small, grasses, seeds, tubers, fruits, berries, nuts), with primary caloric reliance on the grasses, seeds, and particularly the nuts (e.g., acorns) gathered by the women. Men hunted, and thus provided the more prestigious food--meat--and both men and women fished (Gayton 1948: 185). Food was usually obtained within the recognized local territory of each cultural group, supplemented with food obtained during regularized seasonal trips into other areas. Trade with other groups for items not available locally was common (Davis 1961).

Permanent villages were sometimes as large as several hundred (Cook 1955a), and were kin-based in their sociopolitical organization. Residence was usually patrilocal, descent was patrilineal, and moiety or lineal exogamy was the rule (Gayton 1948; Gifford 1926). In some areas, one town served as the center of economic, political, and religious activities for smaller satellite villages (Merriam 1967). Caches of food, treasures, and other goods were maintained at the central town, and there were held important political meetings and religious ceremonies (Bean 1974:15). Each of these centers had one or more chiefs, men who were usually the heads of lineages.

Chieftainship was an inherited status, and chiefs were ranked according to the position of their lineage or according to linkage with particular totem figures (Gayton 1932:372-373; Merriam 1967:340, 347; Bean 1974:22).

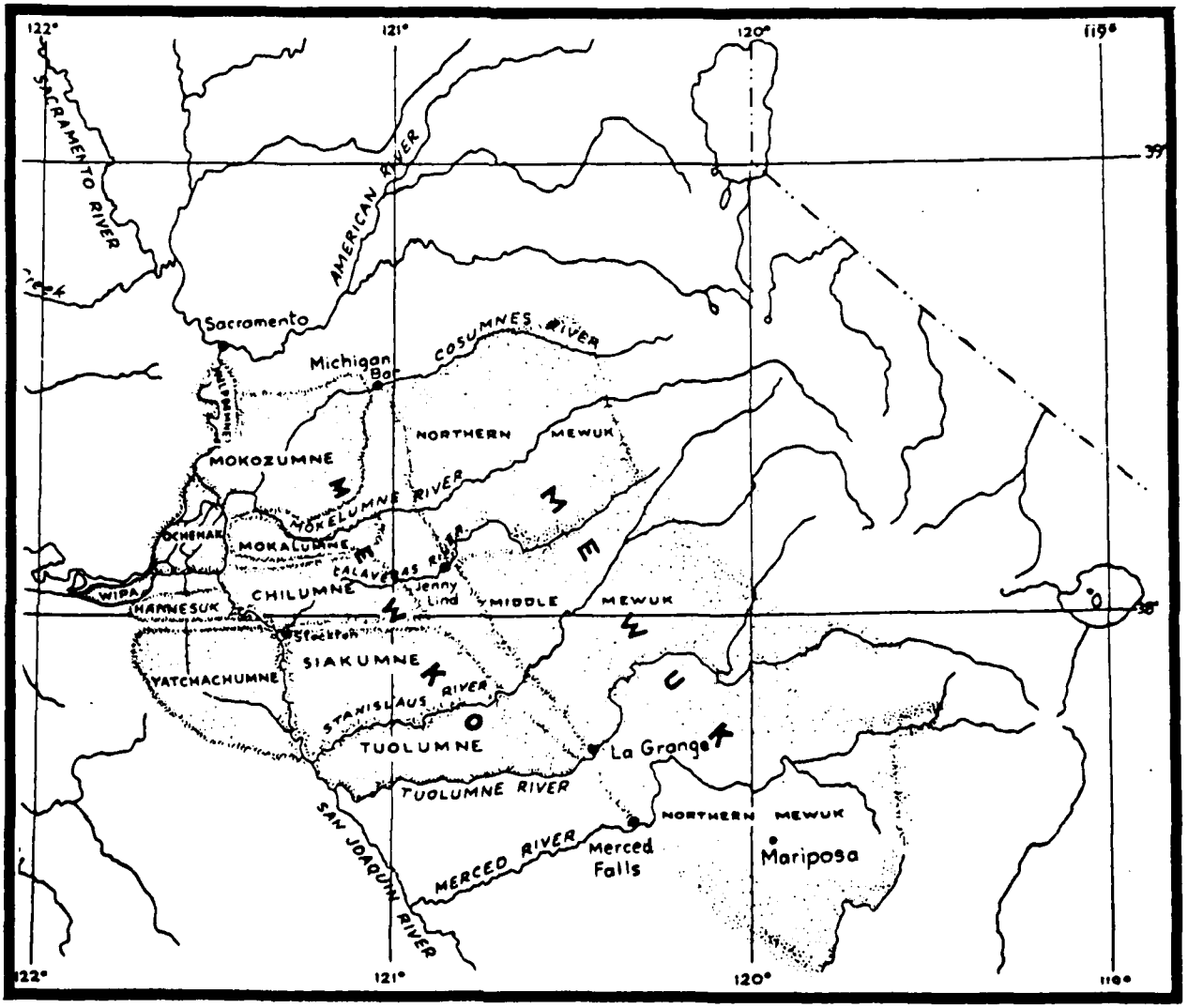
Natural Setting of the Original Inhabitants

The territory occupied by the Northern Valley Yokuts and the Southern Miwok was part of the San Joaquin Valley and the adjacent foothills and mountains of the Sierra Nevada. The San Joaquin Valley extends some 280 miles north to south, from the Stockton Delta to the Tehachapi Mountains; the width of the valley averages 50 miles. The valley floor (the plains) is flat and virtually featureless except for waterways. In prehistoric times, the southern or upper portion of the valley was characterized by two major lakes, and sloughs, marshes, and deltas were throughout the entire valley. Two major rivers run parallel with one another from the Sierra, then diverge on the valley floor, the Kings to the south, and the San Joaquin to the north. Both are fed by smaller streams, most of which enter them, at right angles, on the plains. During heavy snow melt or excessive rains, the two river systems intermingled and much of the valley floor was inundated. Early observers reported on this condition, as the following description made by topographic engineer Lieutenant George H. Derby of conditions in the spring of 1850 illustrates:

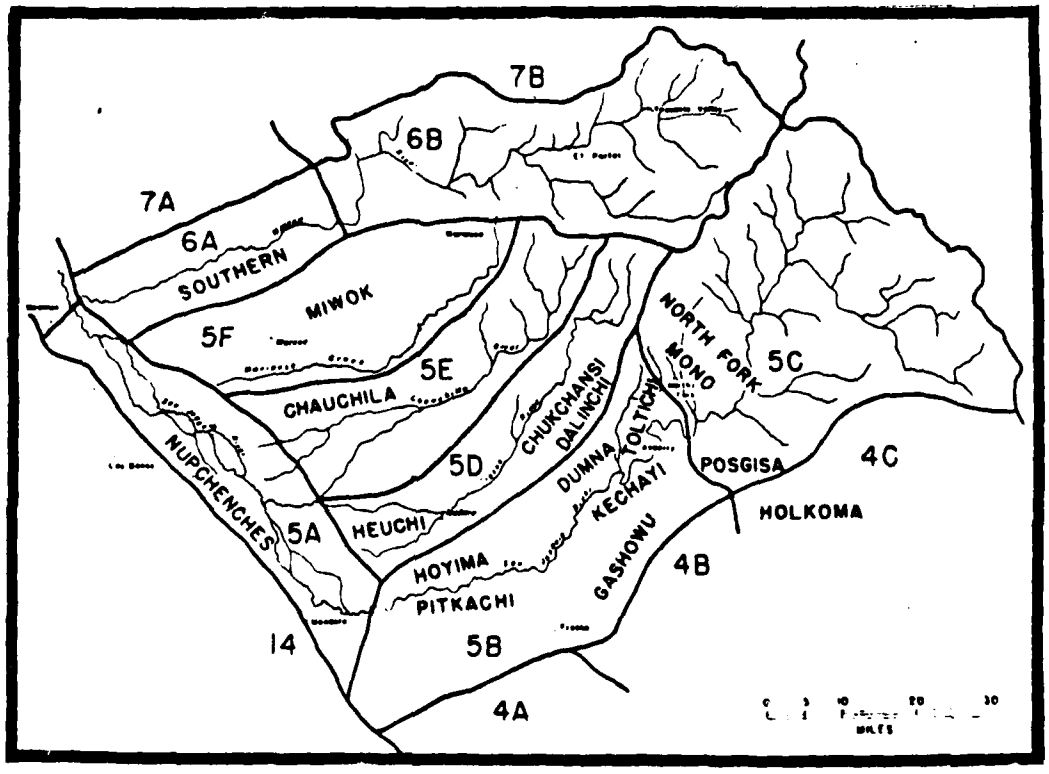
> We left the ferry . . ., and traveling southwest for 19.84 miles encamped on the edge of a swamp at a point about three miles above the mouth of Kings river and immediately opposite (an Indian) village. . . . I was anxious to cross the river and visit it, but was informed by the Indians, a large body of whom swam across to our encampment, that all the country in the vicinity was overflown, and that it would be impossible to cross, even if we were to construct "balsas" of tule owing to the rapidity of the current. It was evident enough that the country was overflown, and as I found it impossible for anything but an Indian to get even to the bank of the river, I was reluctantly obliged to give up my idea of crossing at that point (Derby 1850).

The wetlands, with their tules and marsh grass, contrasted with the rest of the plains, which were sparsely covered with vegetation most of the year. The Spanish priest, Pedro Moraga, stated in September, 1806, that:

> From the point where we left the tule swamps to this place (Bear Creek) the land is really miserable. Salt flats and alkali patches, with innumerable ground squirrel burrows are all that one can see. . . . The forage was extremely scanty, and that the country appeared to have been burned



Map 1: Native Americans of the Merced County Streams Project Area, according to Merriam (1907).



Map 2: Native Americans of the Merced County Streams Project Area, according to Cook (1955a).

over by the Indians did not conceal the fact that the land is very poor (in Cook 1960:284).

Yet in the spring the valley can be beautiful:

> It was the spring of 1851, and the San Joaquin Valley was in an absolute state of nature . . . upon each day's march the landscape presented a striking change of attractions in the flowers that overspread the ground. They alternated in color: one day the flowers were red, the next white, then blue and yellow. The atmosphere was clear and wholesome. . . . (Keyes 1884:234).

Animal life was abundant and varied. An observer in 1851 reported seeing

> . . . a band of several hundred elk, and the motion of their antlers as the animals ran away was worth a journey across the continent to witness. Large troops of wild horses, many deer, antelope, and coyotes were constantly on view (Keyes 1884:234).

The horses had been introduced by the Spanish and were noted as early as 1806 (Muñoz in Cook 1960). Their numbers were increased in the 1830s, the indirect result of drought and consequent reduction of grain crops and natural forage in southern California. Ranchers and farmers were ordered by the Mexican government to kill their excess horses in an effort aimed at saving as many cattle as possible, but many chose rather to drive their stock into the San Joaquin Valley, intending to retrieve them at a later time. The animals multiplied rapidly, filling the entire valley (W. Smith 1939:165-166).

Other animal resources were fish (including salmon), mussels, turtles, migratory waterfowl, and smaller mammals and birds. Insects were numerous and varied, and large numbers of mosquitos bred in the wetlands.

The climate was as it is now--that is, relatively mild, but with excessively hot days (over 100 degrees) in the summer and some very cold days (below freezing) in the winter. Rainfall (a scant 10-15 inches a year) is concentrated between November and April, and there are cyclical droughts and floods. "Tule" fog of zero visibility may be held at ground level by atmospheric conditions for days.

Contemporary Native Americans

None of the eight Native Americans consulted (see Appendix 2) knows the ethnic identity of the original inhabitants of the Merced County Streams Project Area, either for precontact or early historic times. None of them knows of any specific

village site (other than what they have learned from recent archeology), of gathering sites, or of sacred sites in the area. All of them are interested in the findings of the Project and expressed the desire to visit sites during survey or test excavations.

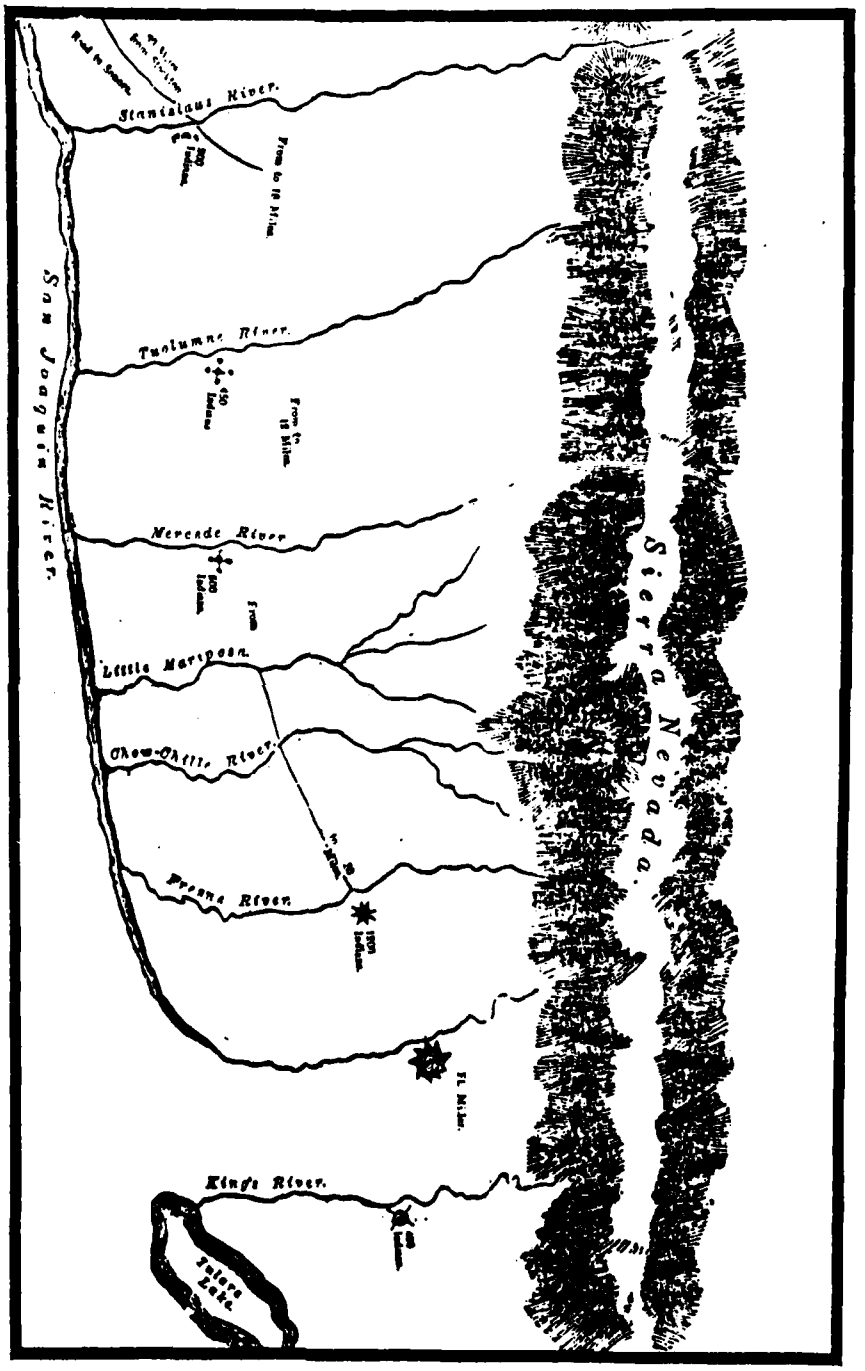
Native Americans throughout California (and other states as well) are concerned about the treatment of burials found through archeological research, and Indians of Merced and Mariposa counties are no exceptions. They are concerned about all Native American burials, no matter the time depth and no matter how distant the genetic relationship. They prefer that any skeletal material found in excavation be covered back over and that the grave goods remain with the body. They are usually willing that in situ measurements, sketches, and photographs be made. If the burial will be disturbed or destroyed in construction, reburial is a possibility but is an unhappy compromise, expensive to the Native Americans financially, spiritually, psychologically, and emotionally.

ECONOMIC, SOCIAL, COMMERCIAL, AND DEVELOPMENT HISTORY

Mining Frontier

The Southern Mines opened up late in 1848 in the Tuolumne River area, and gold mining camps rapidly sprang up along streams and rivers throughout the Sierra Nevada foothills, spreading as far south as the Fresno River by 1850. Men relocated frequently, individually and collectively, in response to stories of richer diggings elsewhere. The earliest camps were laid out haphazardly and until the late 1850s the majority of the houses were built of wood framing and canvas walls, partitions, and roofs. By the late 1850s, cabins with log or board sides, a mud and stone fireplace, and canvas roof came to be standard (Paul 1947:75).

Supplies were brought in from Stockton over what came to be called the Stockton-Millerton Road. The road ran east from Stockton to the foothills, then followed closely the edge of the hills (to avoid the often impassable wetlands), passing through Knight's Ferry, La Grange, Merced Falls, Union (a post office of the late 1800s located in the Northeast ¼ of Section 2, Township 8 South, Range 16 East, USGS Owens Reservoir Quadrangle), Newton's Ferry (on the Chowchilla River), and ending at Fort Miller (later Millerton) on the San Joaquin River. The road marks the boundary between Merced and Mariposa counties and is visible today at the intersection of the county line and Highway 140. The quantity of freight hauled on the road was immense, and large freighting businesses were built up. Hundreds of men and thousands of mules and horses (and a few oxen) were employed, and numerous stopping places (usually a



Map 3: Distribution of Reservation Indians in the San Joaquin Valley, 1852 (Johnston 1852).

ranch, sometimes a hotel, plus stables and corrals) were necessary for overnighting. The nearest regular stopping place to the Project Area may have been Howard's Ranch, about one mile from Burns Reservoir, in Section 36, Township 5 South, Range 15 East, U.S.G.S.

Trading centers or towns developed throughout the mining district, the nearest to the Project Area being Indian Gulch (Section 3, Township 6 South, Range 16 East, USGS Indian Gulch Quadrangle), approximately five miles north of Bear Creek Reservoir.

Placer mining in the Project Area was short-lived, and no quartz mining claims were made in the Merced County Streams Project Area.

Cattle and Sheep Frontier and Development

Cattle ranching. Cattle ranching became an increasingly important economic activity in the Merced County Streams Project Area from the early 1850s on. The early ranchers grazed their stock on government-owned land, purchasing, by gaining a patent or official conveyance, relatively small (compared to the numbers of acres actually used) parcels of land for ranch headquarters. This practice continued for several years.

Warrants for military bounty lands were made assignable in 1852, and "their principal use in California began from that date" (Robinson 1948:182). These warrants entitled the holders to 160 acres (a quarter section) of any public land in the United States valued at $1.25 an acre; if valued at more than $1.25, the difference could be made up. Many who took advantage of military warrants were speculators, and quickly turned a profit on their "investment."

After 1853, some land was acquired through preemption--i.e., the preferred right of purchase given actual settlers. After May 20, 1862, when President Lincoln signed the first Homestead Act, free land for actual settlers became available.

> Under the Homestead Act of 1862 settlers could acquire farms of 160 acres from unappropriated (i.e., public) lands free of all charges except a nominal filing fee to be paid when application was made at the proper land office. Five years of residence and cultivation were required of the settler before he would be entitled to a certificate or patent from the United States. The privilege of commuting was also permitted--that is, of converting the homestead with a preemption right and paying the regular price per acre (Robinson 1948:168-169).

All of these methods of land acquisition were made use of by cattle ranchers in the Project Area.

The foothills along the county line were and are unsuited to farming (except for some non-irrigated grain crops), and cattle ranching continues to be the primary economic activity there. Ranch headquarters were built for each ranch, with house, barn(s), shop(s), corrals, scales, wells, etc., located in one complex (as at Burns Creek Reservoir) and with other buildings, corrals, watering troughs, holding pens, etc., at strategic locations on the property.

Sheep ranching. Sheep ranching began in the Merced County Streams Project Area at least as early as the late 1850s. One of the first sheep ranchers was Cyrill C. Smith, who arrived in California early in 1852, joining his brothers, Pardon and Dorillus, in gold mining at Woods Crossing. Cyrill took time to help with harvesting in June of 1854:

> I have been down twenty miles towards Stockton a haying on dry creek valley. The best wheat and barley grows there I ever saw (;) the hay is mostly wilde (sic) oats from one to two tons per acre. The most splendid Country I ever saw (C. Smith 1854).

This experience may have influenced him away from the mines, for at least as early as 1859 Cyrill, Dorillus, and James (another brother) were raising sheep.

> I am at work for Cyrill & Dorillus attending a band of sheep for them. We live about four miles N.W. from La Grange and Eighteen S.W. from Jamestown . . . there are about seven or eight hundred in this band. They have moved the other band of about eighteen hundred over the river about six miles for better food (J. Smith 1859).

The Smiths were sheep ranching in the general Haystack Dam area by 1872 and, according to the Merced County Assessment Roll, they owned 5,000 sheep valued at $7,500 and 11,000 acres of land valued at $13,750. Improvements on the land must have been minimal as they were evaluated at $50.00. This land was northwest of the Haystack Dam area, but by 1881 C. C. Smith owned all of Section 19 (directly in the proposed Haystack Dam area), the North ½ of 20, and the West ½ of the Northwest ¼ of 29 (Merced County Assessment Roll, 1881). His stock had increased to more than 17,000 sheep, and his other taxable possessions indicate that he was very successful:

2 watches	$100
furniture	200
sewing machine	25
52 tons grain	780
3 wagons	175

2 harness	$ 25
3 American horses	300
2 colts	50
11 half breed horses	295
3 dozen poultry	10
1 mule	20

By the time of Cyrill Smith's death, he owned 30,000 acres. These were inherited by his son, Elmer D. Smith (Aucutt 1933), including holdings in the proposed Haystack Dam area (Official Map of Merced County 1909).

J. W. Mitchell was another early sheep rancher in the Merced County Streams Project Area. Mitchell bought thousands of acres of land in the San Joaquin Valley at $1.25 an acre, and at one time he owned more than 100,000 acres in Stanislaus and Merced counties (Mitchell 1877), including land at and near proposed Castle Dam

> Next he bought thousands of head of sheep to pasture off the wild grass, weeds and brush that grew on his land. He also bought thousands of head of horses and cattle (Atwater History Club 1958:20).

Sheep were also raised in the Burns Reservoir area (e.g., by John B. Bennett), but sheep ranching did not continue to thrive as did cattle ranching. Those areas in and near the foothills which had been used for sheep ranching became cattle grazing areas or supported grain (dry) agriculture. Those areas farther out on the plain were converted initially to grain agriculture, later to irrigated crops.

Farming Frontier and Development

Dry farming. Farming began in the Merced County Streams Project Area in the early 1850s. Agriculture was a challenge to the new settlers, who were unfamiliar with dry farming, knew little if anything about irrigation, and had bad luck as well. In 1854, for example, smut, drought, and insects created problems with crops througout the San Joaquin Valley (Alta California 1854), but knowledge gained from experiments in the northern part of the valley with dry farming, with types of wheat suited for the climate, and with farm machinery made possible the development of farming on a large scale.

Farmers moved into the area in increasingly large numbers, gaining patents to the public land and planting grains. Disputes between farmers and ranchers were not uncommon, occasioned by crop damage and/or destruction by cattle. The ranchers insisted that the farmers were responsible for fencing the cattle out; the farmers insisted that the ranchers were responsible for fencing the cattle in.

> Cattle were very troublesome, and had to be herded night and day to prevent their encroaching on the fields and destroying the growing grain (Lewis Publishing Company 1892:74).

The ever-increasing farmer population became politically powerful and in 1874 the "No Fence"--meaning the farmers did not have to fence--law was passed.

Grain was grown in and near the foothills and in the downstream and plains areas also. In the Castle Dam area, e.g., J.W. Mitchell's sheep cleared his land of ground cover, following which he encouraged others to dry farm it, renting it out in 2,000-acre parcels. He built a house for each tenant and furnished them with plows, grain seeds, wagons, and farm machinery. He himself also grew grains.

Intensive agriculture. Wheat and other grain farming, along with cattle ranching, continued to be the main economic activities of the eastern Merced-western Mariposa counties areas through most of the 1880s, but the development of an irrigation system by Crocker Huffman Land & Water Company in 1888 made possible intensive agriculture and resulted in further changes in the area beginning about 1900. Numerous crops were introduced, including fruit and nut trees, vegetables, and cotton. Dairy farming developed with the introduction of irrigation and the assurance of adequate feed. Turkeys were found to do well in the area.

Railroads, Other Transportation, and Communications

Railroads. The railroad came to Merced County in 1872, resulting in diminished use of the Stockton-Millerton Road. Bridges were built across creeks, and freight was hauled by wagon team from the railroad line to the plains and hills to the east. Complaints were made of farmers who changed the routes of roads "to suit their own convenience or whim," and, as a result, some of the bridges were left without roads to connect them (Outcalt 1925:308).

The importance of the railroad in the changing economy of the Project Area cannot be overstated. The population of the mining country of the foothills had dwindled by the 1870s, and the major market was to the north, in San Francisco, from whence agricultural products were shipped worldwide. The railroad provided reliable, satisfactory transportation, and was thus an impetus for intensive agriculture development.

The railroad had another effect on the growth and development of the area. It advertised the "health, wealth, and prosperity" attainable in California, and offered low fares to get here. Land was still easy to obtain, and many of the earliest

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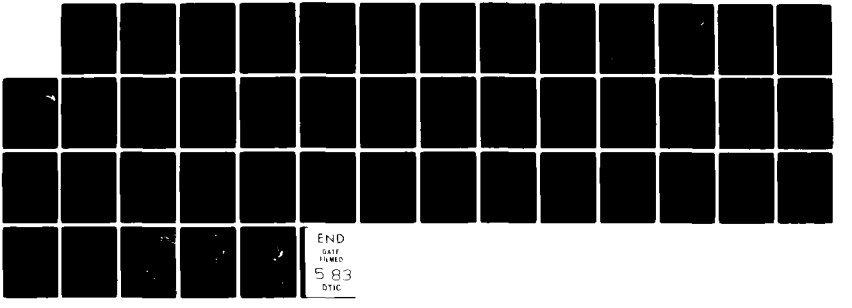

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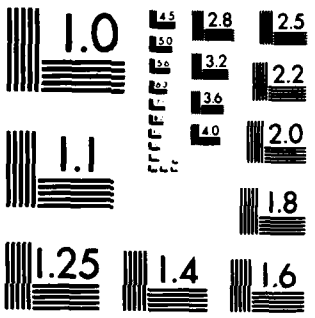


arrivals (by train and otherwise) became large landholders (i.e., over 5,000 acres).

Towns developed in the area with the coming of the railroad (only Plainsburg predated the railroad, and it diminished in importance once the system was in operation), and increased in size as the rural population increased. The population of Merced County grew from 8,085 in 1890 to over 15,000 in 1910 and more than 25,000 by 1920. Part of this growth was the result of divisions of land into colonies or other subdivisions. The first attempt to establish a colony (for Hollanders on 4,000 acres near Lake Yosemite) was a failure, as were some of the others, but most were distinct successes, contributing to the development of intensive agriculture and to the increase of population as well--and all of this an outgrowth of the railroad system.

Other transportation. As noted above, the only established route of transportation into the Merced County Streams Project Area prior to the railroad was the Stockton-Millerton Road. It ran east from Stockton to the foothills, then south above the seasonal wetlands. The Stockton-Millerton Road continued to be the most important route of transportation until the early 1870s.

> Other roads were created in the early days by the simple process of dedicating a more or less indefinite strip of country to travel. The line was made definite upon the ground by traveling over it, but in the case of washout and ruts the travelers pioneered a new route alongside the old one. There was plenty of land, and for the most part it was public land, and was used only for cattle range, except the comparatively small areas along the river and creek bottoms (Outcalt 1925:307).

After the railroad was established on its north-south route, east-west roads developed from the railroad tracks to the foothills.

Communications. During the gold rush, mail arrived once a month. It was carried into the Southern Mines by the express service of Reynolds & Company, bought out by Wells, Fargo & Company, which built an office in Hornitos in 1854 (Chamberlain 1972:52), and charged $5.00 for the delivery of a letter from San Francisco (Clark in Chamberlain 1972:19).

The railroad system established in 1872 greatly improved mail service and other contact with the rest of the United States.

Settlement

Settlement pattern. Settlement during the gold rush was in the foothills, along streams and rivers. Mining camps were often short-lived, as were trading centers or towns. Population density was high in the mining areas until about 1860. By that time, many miners had grown discouraged at their meager earnings and had either returned home or found other ways to earn a living. Often the new work was related in some way to providing food, drink, mail, or supplies to the miners. Trading posts were set up, express services provided, and teams and wagons hauled in machinery (stamp mills, for example), building materials, etc. Some moved westward and became cattle ranchers.

Merced County was formed out of Mariposa County in 1853, and the Stockton-Millerton Road became the county line. For many years the bulk of Merced County's residents lived in the area near that line.

> Scarcely too much emphasis can be laid upon the very close connection which existed between the new county, with its activities creeping out into the big plain of the San Joaquin, and the mother county in the hills. The new county was creeping out onto the big plain of the San Joaquin, it is true; but its markets, its associations, the former dwelling-places of many of its people, a large part of its social connections, and numberless other bonds were across the line. The activities of the two counties were different in character from the beginning, from the very nature of their topography; but in many important respects they formed one community. The very line which divided them politically from 1855 on, the Stockton and Millerton Road, the main (indeed the only) artery of travel between north and south, was a bond of union rather than a barrier (Outcalt 1925:163).

The primary activity "creeping out" into the San Joaquin Valley was cattle ranching, and the settlement pattern of the 1850s and 1860s reflects this. The Merced County Assessment Roll for 1857 shows that most of the population was located along the Merced River from Merced Falls out onto the plains almost as far as the San Joaquin River, and along creeks from Burns and Bear to the Chowchilla, here stretching no farther onto the plains than about halfway to the San Joaquin.

> Apparently the general pattern for the east side (of Merced County) in these early years of settlement was for the young miner to come down from the gold field, establish a residence and ranch, and run it alone or in partnership with another man. Eventually he would feel the need to begin a family and would return to his former home to find a wife. Having done so, both would return to California to settle permanently (Graham 1957:41).

The settlement pattern in the foothills continued during the grain farming era, though the pattern of land ownership, of necessity, changed. Increasing numbers of new settlers (some from the mines, many from outside the state) arrived to reduce the plain between the foothills and the San Joaquin River to private ownership and to try their hand at farming. The farms were smaller than the cattle ranches, although some of them became very large later on, and the farm population density was higher.

The actual distribution of the population is impossible to determine for this era as the 1880 census data are not divided into units smaller than a county, but Graham (1957:60-61) has correlated soil types with impressions of "old timers," and concludes the following:

> It appears that at the center of the favored piedmont alluvial plain, farmhouses were located on almost every section; in other words, there was about one house to the square mile. On the margins of this belt, the farmhouses became fewer, averaging one farmstead to every two or three square miles. Once outside those areas where wheat farming was carried on, the population became truly sparse.

Merced County population increased dramatically following the coming of the railroad. The 1870 census shows 2,807 individuals living in Merced County, most of them on the east side. By 1880, the population was 5,656; by 1890, 8,085. It is in the areas of intensive agriculture (i.e., mostly the alluvial plains) that population increased the most.

The 1900 Merced County census shows an increase in population to almost double that of 1890, and during each decade after that it increased between 40 and 60 percent. By 1950, it was about 77,000, most of it the result of urban growth.

The population of that portion of western Mariposa County which is part of the Merced County Streams Project Area has gone through the same changes as that of contiguous Merced County.

Ethnic composition. During the early days of the gold rush, most of the miners were from the eastern and southern United States, and were young and single. An analysis of the 1857 Assessment Roll for Merced County shows that:

> With the exception of a very few Spanish names . . . the names are practically all American of the sort that were brought from England (Outcalt 1925:156).

Italians are reported in the Mariposa (town) area in 1849 (Reynolds in Chamberlain 1972:15), and at Indian Gulch sometime thereafter ("Old Timer," in Chamberlain 1972:153-154), and 82 blacks and 1,571 "foreign residents" are recorded in the 1852 state census (Alta California, November 12, 1852).

The picture was probably little changed in the 1860, although this is difficult to determine as the 1860 federal census does not record state or national origin.

The 1870 census shows 2,807 individuals living in Merced County, 611 of them foreign born (Outcalt 1925:299). By 1880, the population was 5,656, 1,700 of whom were foreign born. In 1890 it was 8,085, with over 2,000 foreign born. Most were from China (597), next Ireland (265), then Germany (177), British America (121), Mexico (110), England and Wales (93), France (59), Scotland (38), and Sweden and Norway (27). The bulk of the population during these decades was male (Outcalt 1925:299-300). The first Japanese, Portuguese, and Italians are identified in the 1900 census. The male-female ratio of the native born population was closer to even (3,941 to 3,079) than before, but that of the foreign born was still predominantly male (1,703 to 492) (Outcalt 1925:301).

Ethnic diversity continues to the present day, as is demonstrated by the numerous ethnic organizations listed in the local phone book.

POSSIBLE EXPLORATION OF THE PROJECT AREA

Early Exploration of the Project Area

The Advisory Council on Historic Preservation recognizes that studies focussed on the "lines of march, stopping places, and landfalls of early explorers" are legitimate research concerns (Advisory Council on Historic Preservation 1980:37-38). Cook (1955a) has established the route of the Moraga-Muñoz expedition to a large extent, and full-scale research on that expedition does not seem warranted. Archeologists should, however, keep the expedition in mind during test phase and mitigation procedures.

The route of Jedediah Smith through the general area in the late 1820s is a matter of dispute (see Fletcher 1924, Merriam 1923 and 1924, on this), and material remains recovered archeologically which appear to fit into the 1820-1830 period should be carefully analyzed.

Native Americans of the Project Area

Ethnographic and ethnohistoric data on the Native Americans of the Merced County Streams Project Area are lacking, and it appears that the Area was unoccupied at least as early as 1806. Archeological research should be conducted to determine, to the extent possible, who the late prehistoric residents were (if

any), and why they abandoned the Area. It is known from previous archeological studies that the material culture of the Yokuts and Miwok differs, and archeological evidence might provide data on the following:

Who lived at each of the four specific project areas in late prehistoric times?

Were the foothill/plains areas a transition zone between the two groups?

Was early historic contact made but not recorded by the Spanish?

Did the population die as a result of war or disease?

Were the Chauchila to the south, who had a reputation for being warlike, responsible for the lack of occupancy of the area?

Anglo American Era

The gold rush. The early records for the Merced County Streams Project Area are missing (i.e., those prior to 1854), diaries by gold miners do not provide Project Area-specific data, and there are therefore many gaps in the early historic record. Archeology can help fill these gaps.

Remains of architectural structures (tents, plank or log tent cabins, rock houses with canvas roofs, etc.) provide relative chronological data for the occupancy of an area by gold miners, traders, etc. The areas for Burns and Bear creeks reservoirs should be examined most carefully for such remains, particularly the more ephemeral evidence of tents, tent cabins, and/or tent "cities." This may make possible a partial reconstruction of the cities." This may make possible a partial reconstruction of the early history of the westernmost portion of Mariposa County. Architectural style is evidence also of cultural affiliation or influence, and the inadequate census records may be "fleshed out" by the careful study of architectural remains.

Evidence of Indian-white contact should be sought. Miners often employed Indians, especially in the early years of the gold rush. If, indeed, the Merced County Streams Project Area was abandoned by Native Americans as early as 1806 (and the evidence for this is very strong), the reintroduction of Native Americans, whether California Indian or otherwise, may be easily discernible in the archeological record.

It is possible that data on the Project Area during the gold rush can be derived from early newspapers, but there are problems here. The Mariposa Gazette, established in 1854, has had one of the longest continuous runs of California newspapers. The courthouse in the town of Mariposa has copies of the entire

run of papers available for research. The paper has not been indexed in any way, and use of the papers without a locational name is virtually impossible. Even a page-by-page reading of the paper may not yield specific information on the relatively remote portions of Mariposa County.

Nonlocal papers, such as the San Joaquin Republican and Alta California, were often vague on locational data, and it is hard to predict how much area-specific information they might yield. Examination of newspapers is very time-consuming, and the amount of data to be recovered is unpredictable. Recommendation of research of early newspapers does not seem warranted.

Ranching, farming, and intensive agriculture. The economy of the post-gold rush Merced County Streams Project Area followed the same stages of development as did the rest of the San Joaquin and Sacramento valleys (i.e, cattle and sheep ranching, non-irrigated farming, intensive agriculture, and urbanization), although the timing was not synchronous throughout the entire Great Central Valley. The chronological differences have been ascribed to a variety of "causes," and it would be interesting and valuable to investigate these. Answers to the following questions should give a clearer picture of the economic development of the Project Area, of the San Joaquin Valley, and of the Central Valley.

> What role did Spanish and Mexican land grant titles play in the economic development of the Project Area as compared with the San Joaquin Valley and the Great Central Valley?
>
> Where were the early cattle/sheep ranchers from, and what in their cultural background (if anything) led them to be ranchers instead of farmers? (and the converse.)
>
> Was the choice of location of ranch headquarters culturally influenced or was it a function of natural resource distribution?
>
> Does the location of ranch headquarters provide evidence that many early ranchers were from the southern United States (i.e., did they build on the "crick bottoms"?).
>
> Do the first crops provide evidence of place of origin of the early farmers?
>
> What role did ethnic minorities play in the economic development of the Merced County Streams Project Area?

Some of these questions can be answered through archival research findings, some through archeological research findings. The answer to the last question, for example, may be found in incorporation papers and ledgers of early ranches and farms. The ledgers often include names of farmhands, their places of dwelling, duties, wages, and other details of everyday living.

Since the Advisory Council on Historic Preservation (1980:58) recognizes that the: "contribution of those groups that wielded little economic power, and that were often illiterate, at least in English, to the history of the Nation and its regions are often poorly documented," records concerning them are worthy of serious investigation.

The railroad and urbanization. Since neither the railroad nor urban development existed directly within any of the four dam/reservoir areas (although railroad lines formerly ran just outside the Castle Dam area), it seems unwarranted to suggest research questions related to either the railroad or urbanization.

SITE-SPECIFIC HISTORY: BURNS RESERVOIR

Burns Creek Dam, if enlarged, will make possible the creation of a pool of water which could inundate small parts of Sections 22 and 27 of Township 6 South, Range 15 East; 19 and 30 of Township 6 South, Range 16 East; and large parts of Sections 23, 24, 25, and 26 of Township 6 South, Range 15 East (especially large portions of Section 25) on USGS Quadrangle, Haystack. That this area was mined for gold is known from the remaining evidence; determining who mined in the area, however, would require more time than was available for this study.

A reconstruction of the acquisition of parcels 18, 19, and 30 is shown in Figure 1, next page. The Northeast quarter of Section 30 was acquired by Joseph P. Wing under the military bounty act in February, 1861, and assigned to Joseph Moray.

Moray also owned a 250 acre ranch on Burns Creek, seven miles below Hornitos. The northeast corner of the ranch was at the mouth of Greaser Gulch. Moray and his partners, J. Pointel and Jacques Dejian, purchased the ranch from Peter Navarre for $1000 on August 2, 1861 (Mariposa County Deeds M: 300). For the fiscal year of 1860-61, Navarre paid taxes on $800 in imporvements on his property, but no value of real estate or acreage is listed. He also listed $50 in personal property. For the following fiscal year, Navarre paid taxes for $1500 in imporvements on his ranch on Burns Creek. His personal property for the years consisted of four horses valued at $200. After Moray bought the land, he was assessed taxes on a "portion of ranch adjoining Merced County." His claimed value of the land and improvements was $500. No personal property was listed (Mariposa County Assessment Rolls 1860-61, 1861,62, and 1862).

In January, 1866, Moray sold several parcels of his land to John B. Bennett of Merced County. Included in this sale were the Northeast ¼ of Section 30 (Township 6 South, Range 16E), and the ranch bought by Moray and Company. In 1867, Bennett began obtaining patents to various parcels of land began purchasing the patented land of others. Within 10 years, he owned about two-thirds of the three sections shown in Figure 1.

The Assessment Roll for 1867 lists Bennett as the owner of a barn and enclosure on the northeast side of the Millerton Road, about 1¼ miles north of Robert Simpson's Ranch (at the crossing of Bear Creek by the Millerton Road). This is approximately the location of the modern-day Waltz Ranch. The 1874 Merced County Map shows J. B. Bennett as the owner of land in Sections 19 and 30 in Merced County, and a structure is shown on the south side of a tributary to Burns Creek (Figure 2). This is probably the Waltz Ranch site. This same location had a structure as early as 1854. The owner of the structure was Howell (General Land Office plat, fractional portion T 6S, R 16E, 1854). No other evidence of early ownership could be found in the county records, but lengthly historic use of the Waltz Ranch site can be inferred.

Bennett was also listed as the owner of one adobe building situated on Burns Creek, about one mile north of the barn and enclosure at the Waltz Ranch site, and within Mariposa County. The improvements at the two sites were valued at $750 (Mariposa County Assessment Roll 1867).

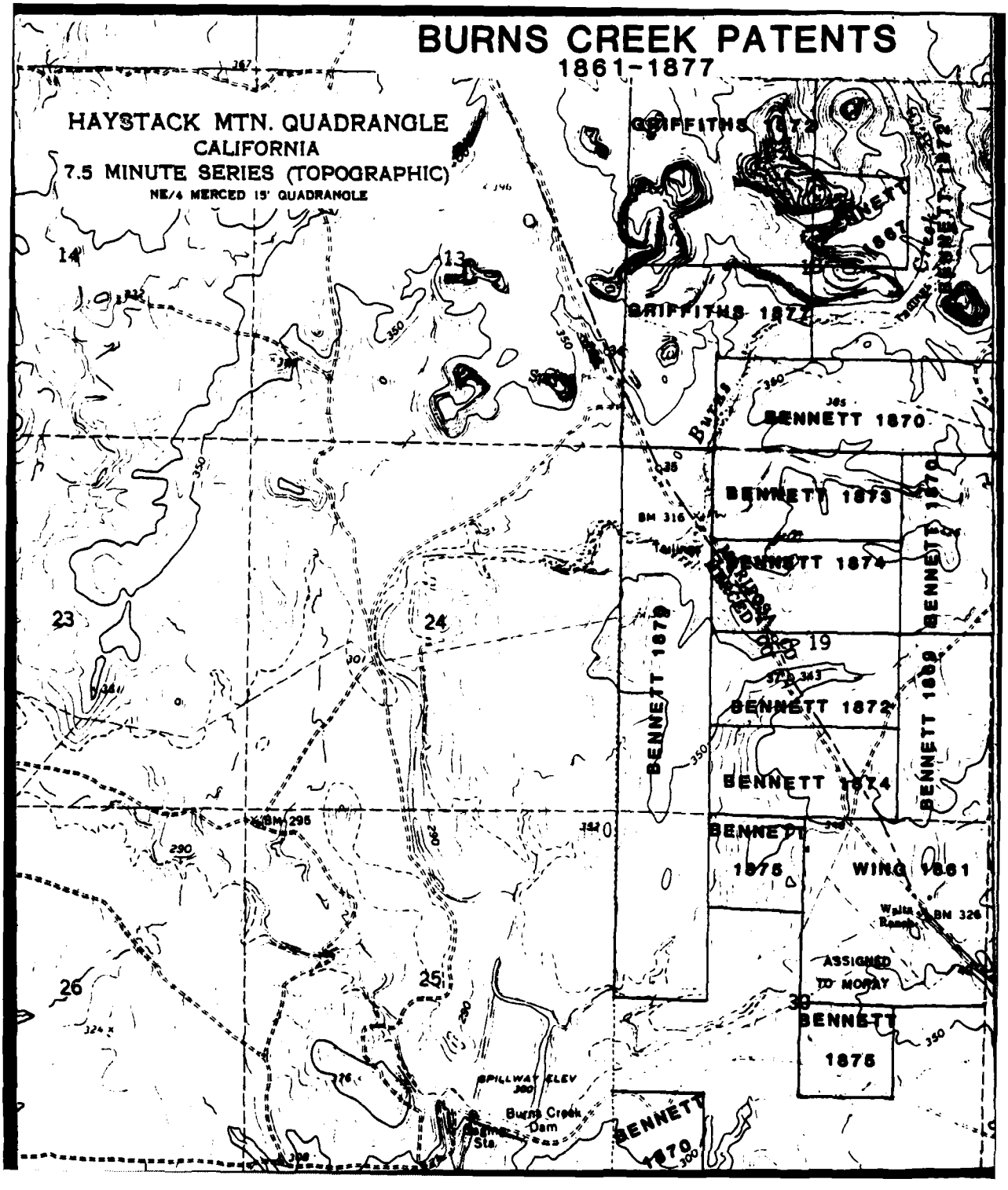
The location of the adobe structure is approximately the location of the historic foundation on CA-Mrp-592. Although the 1870 General Land Office map does not show a structure at this location, there is an improved field indicated on the east side of Burns Creek on the terrace which straddles the line between Sections 18 and 19. This may indicate that the structure was not in use at this time or was not seen by the surveyors.

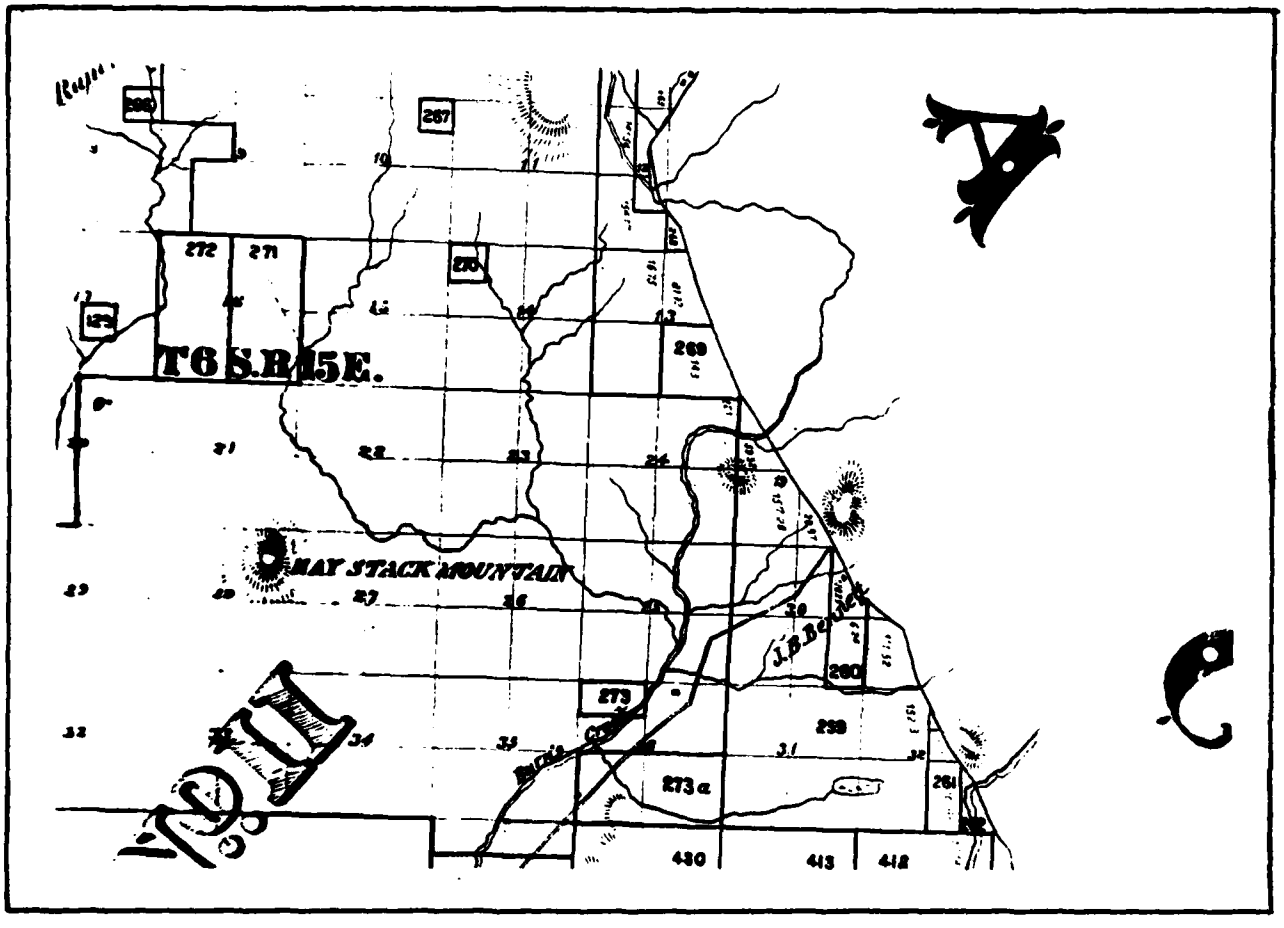
In 1872, Bennett owned 4,960 acres in Mariposa County. His personal property included 3,100 sheep and 1,250 lambs (Mariposa County Assessment Roll 1872). As no other livestock is listed, it can be concluded that Bennett's land in the Burns Reservoir project area was used for grazing of sheep. The structure at CA-Mrp-591, situated with the fence, may be a lambing pen related to this period, or perhaps, to Navarre's or Moray's ranching activities in earlier years.

A pioneer merchant of Mariposa, William A. Grade, began buying Bennett (and others) out in 1877, eventually acquiring

> 10,000 acres of land in Merced County, where he raises cattle, hogs, and sheep. At one time he devoted his time to the culture of cotton, planting 200 acres to this product; he realized 400 pounds to the acres, for which he received thirteen cents a pound (Lewis Publishing Company 1892:250).

In 1880, Grade owned the E½ and the SE¼ of the SW¼ of Section 18; Section 19 east of the county line in T 6S, R 16E, and the fractional NE¼ of Section 30 (Figure 3). The only improvements within the area were valued at $50 and were located in Section 19 (Mariposa County Assessment Roll 1880). This suggests that the structure at CA-Mrp-592 was in use at this time, or that there was another structure within the section outside the project area.


BURNS CREEK PATENTS
1861-1877
HAYSTACK MTN. QUADRANGLE
CALIFORNIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE/4 MERCED 15' QUADRANGLE
GRIFFITHS 1872
BENNETT 1867
GRIFFITHS 1872
BENNETT 1870
BENNETT 1873
BENNETT 1874
BENNETT 1879
BENNETT 1869
BENNETT 1872
BENNETT 1874
BENNETT 1875
WING 1861
ASSIGNED TO MORAY
BENNETT 1875
BENNETT 1870
BM 316
BM 295
Burns Creek Dam
Sta
SPILLWAY ELEV
14
13
23
24
19
26
25
30



Official Map of Merced County, 1874
(Courtesy of California State Library)

Figure 2

Grade began leasing land to D. I. Waltz early in the present century. It is tempting to suggest that graffiti found while site surveying the Burns Creek Dam area were made by one of the Waltz children--AW APR 31, 1906, and EW APR 31, 1906--but two forms of evidence suggest otherwise: (1) the Waltz children were named Louis and Dora, and (2) the earliest record of a lease between Waltz and Grade is 1908. The lease continued, and in 1919 it was renewed once more to 1923. The rent was $4,856.50 per year for 8,830 acres to be used for grazing and farming. Any oil or minerals discovered were to be maintained by the lessee. In 1925, the Grade Ranch became the Waltz Ranch by deed from L. A. and Amelia Grade (Merced Book of Deeds 99:430). The Waltz Ranch has continued to increase its holdings through the years, and is shown on the most recent USGS quadrangle, Haystack (1962).

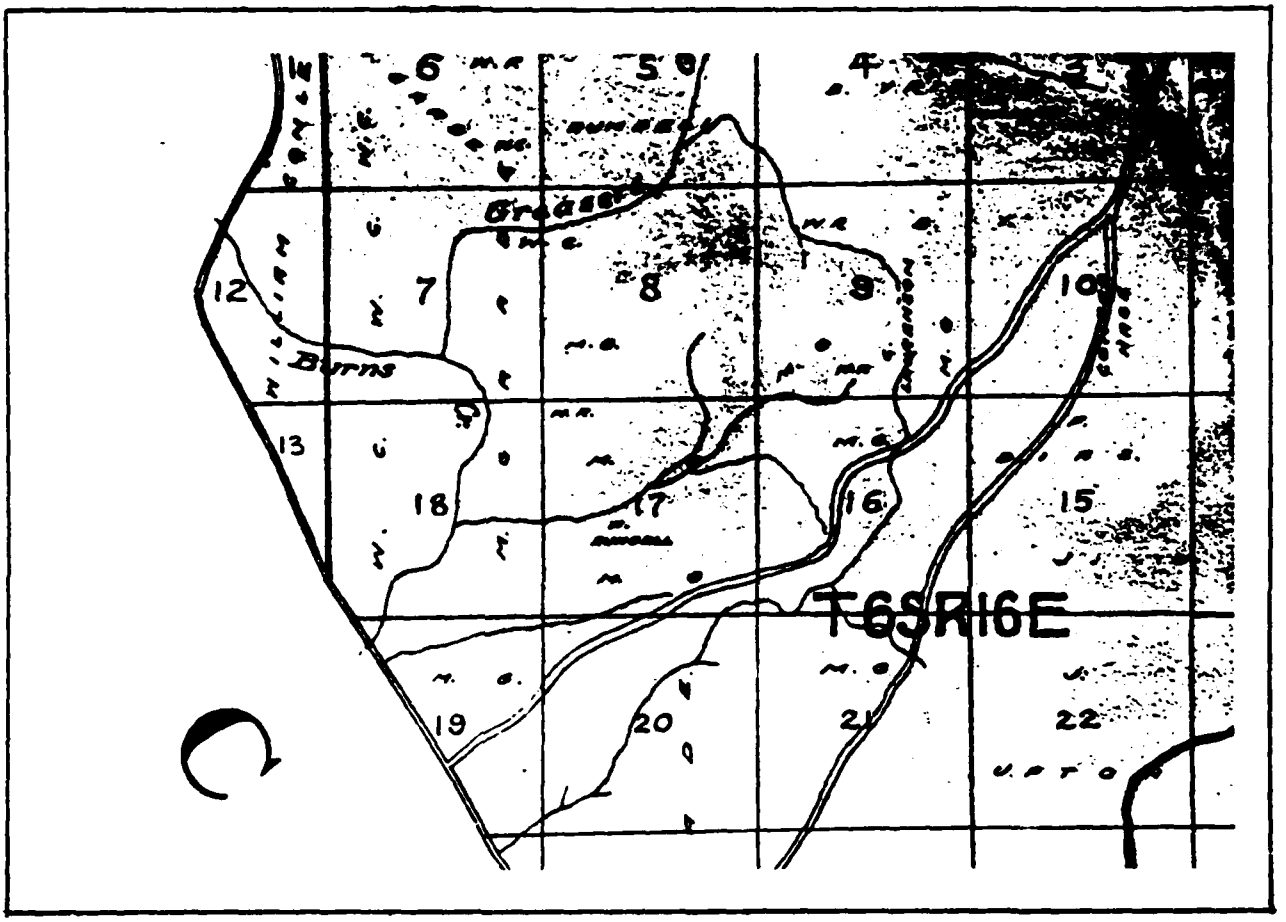
Thomas O. Griffith, who acquired nearly one-half of Section 18 between 1872 and 1877, was adding to his previous holdings to the west. The Merced County assessment roll for 1864 records him as the owner of 1,163 acres in Township 6 South, Range 15 East, with $300 worth of improvements on that land. This was in addition to a one and one-quarter acre parcel--undescribed--evaluated at $5.00, a high value, with $350 worth of improvements on that. No cattle are recorded for him, but work mules, a wagon, and farming utensils are.

Others who held part of central and western portions of Burns Creek Reservoir in the 19th century include Isaac Friedlander, who owned a total of 40,640 acres in Merced County in his name, and Friedlander et al. held an additional 20,240 acres (Merced County Assessment Roll 1872). L. U. Shippee had property near the area in 1899, but this was acquired by Los Animas & San Joaquin Land & Water Company by 1909 (Official Map of Merced County 1909). Crocker Huffman Land Water Company later acquired all the holdings of Los Animas & San Joaquin Land & Water Company (Official Map of Merced County 1919; Figure 5).

At this point in time, it is impossible to determine the time at which the other stone structures within the reservoir area might have been built, other than to say possibly as early as the Gold Rush. Structures of stone or adobe came to be built chiefly in response to the danger of fire, and the materials used and method of construction varied according to materials available and the cultural background of the builder. Schist, which fractures into horizontal slabs early and requires little if any dressing, was readily available in the project area and was used by the Italians--the "stone masons par excellence" of the gold field--to construct schist and mud mortar structures (Heizer and Fenenga 1948:93, 94; Fenenga 1981).

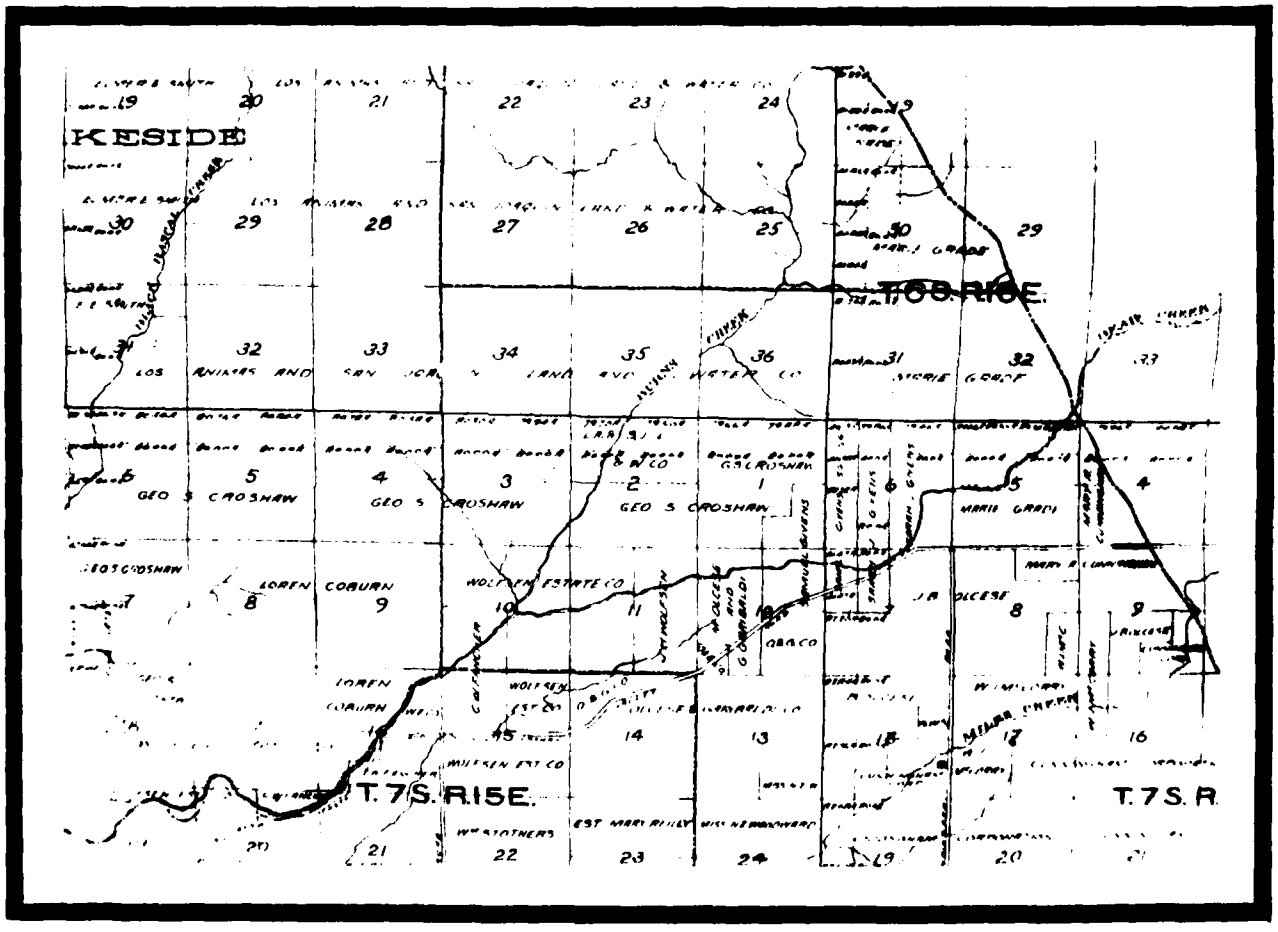
Rock walls are usually attributed to the Chinese.

Current owners of the area include a Southern California attorney, John Myers, who has one of his Flying M ranches on Burns Creek, and Roy and Veva Morrison.



Official Map of Mariposa County, 1897
(Courtesy of California State Library)

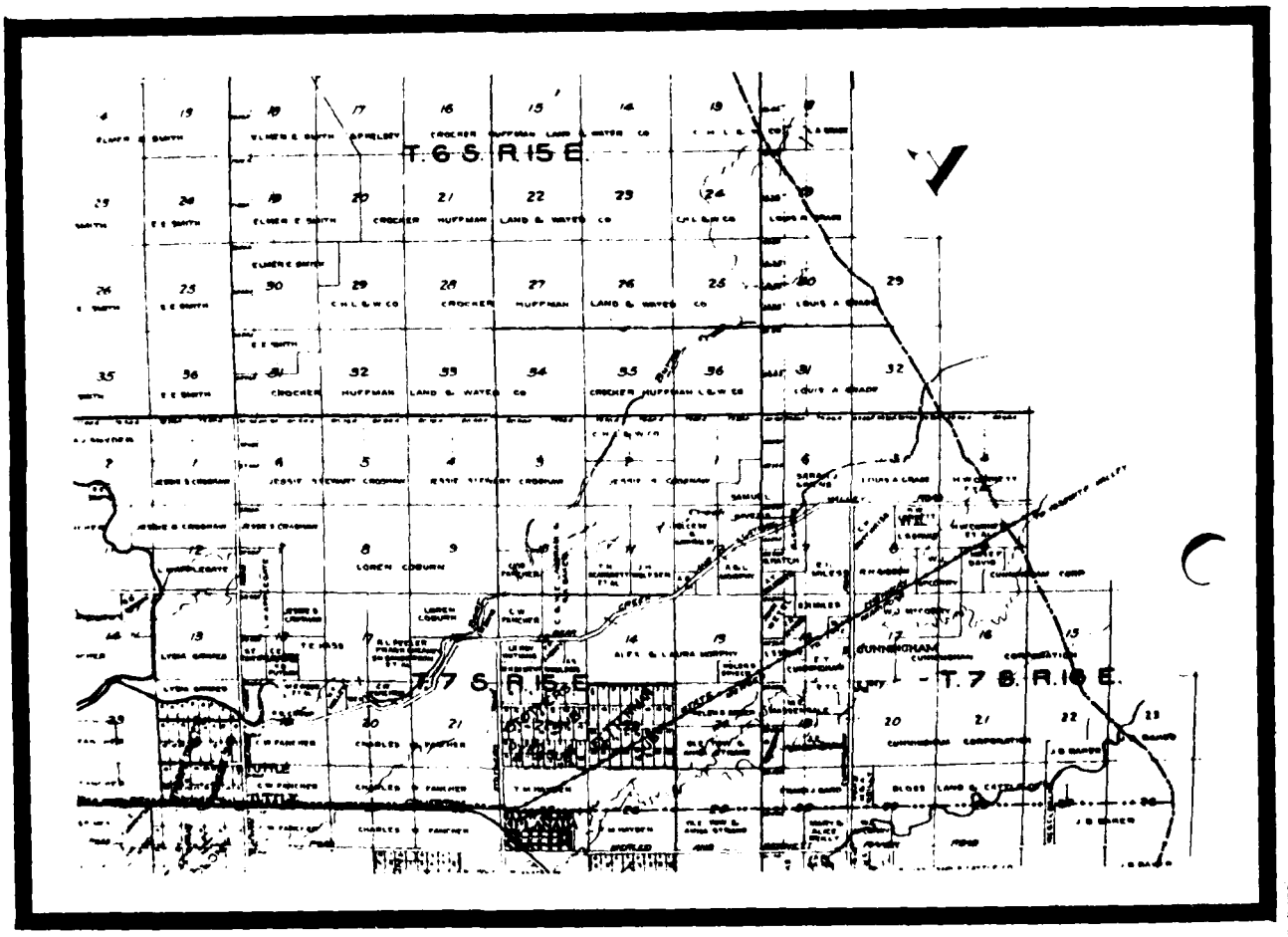
Figure 3



Official Map of Merced County, 1909

(Courtesy of California State Library)

Figure 4



Official Map of Merced County, 1919

(Courtesy of California State Library)

Figure 5

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APPENDIX 2

INTERVIEWS

As a part of the Scope-of-Work interviews were required to be conducted with Native Americans, local residents, and other individuals who might have information on cultural resources and historical events which were assoicated with the project areas.

In compliance with this task, interviews were conducted by Jeanne Muñoz, Melinda Peak and Ann Peak. Each interview has been summarized.

Meeting in Mariposa
August 6, 1981

Coordinated by Jeanne Muñoz

Eight Native Americans form Merced and Mariposa counties (Nick Brocchini, Fern Fulcher, Les James, Jean James, Jay Johnson, Mary Lewis, Frank Ogler, and Helen Ogler), Patti Johnson of the U.S. Army Corps of Engineers, and Harvey Crew and Jeanne Muñoz of Ann S. Peak & Associates met in Mariposa the evening of August 6, 1981. Johnson, Crew, and Muñoz described the Merced County Streams project, provided maps of the area and copies of reports of previous archeological research in the area for examination. The Native Americans asked questions, examined the materials, and expressed their interest in the project. Names of potential Indian monitors were suggested, and the possibility of other Indians visiting the project area was discussed. General concerns were voiced about such matters as appropriate treatment of burials.

No one of the eight know of any historic use of the project area by Native Americans, nor of any sacred sites or gathering sites there.

Follow-up (2) to
Meeting in Mariposa:
Interviews with
Jay Johnson

Interviewed by Jeanne Muñoz
August-September 1981

Jay Johnson, a Miwok-Paiute Chairperson and Native American Heritage Commissioner, was consulted about specific concerns among local Native Americans in regard to burials (see Contemporary Native Americans (Appendix 1). He was later asked about petroglyphs in the Yosemite National Park area. He is very familiar with them, and is willing and able to examine those of the project area to determine possible stylistic affiliations.

Follow-up (3) to
Meeting in Mariposa:
Interviews with
Fern Fulcher

Interviewed by Jeanne Muñoz
August-September 1981

Fern Fulcher, a part Miwok resident of Atwater, volunteered to contact another Indian woman in Merced County (Denise Woodruff), and to find out if she might know anything about the Indians of the project area in the 1800s. At least fifteen calls were placed to her, only two of which found her home and well enough to come to the phone. She was equally as unsuccessful in reaching her acquaintance, and no new knowledge was gained.

Follow up (4) to
Meeting in Mariposa:
Attempt to contact
Wahilia Ocampo

Jeanne Muñoz
August 15, 1981

Wahilia Ocampo of the Indian Studies Department, Merced College, was recommended as a source of information by Fern Fulcher. She is out of town, in the process of moving, and the college does not know how to reach her.

Jeffrey Miller
63 So. Beard Blvd.
San Fernando, CA 91340

Interviewed by Ann S. Peak
August 11, 25, 1981

Mr. Miller spent considerable time on the property as a youth. He was shown the petroglyphs and old structural remains by his father.

Mr. Miller provided specific information on historic buildings, petroglyphs, and bedrock mortar sites in the Bear Creek study area. He gave details on the presence of several clusters of historic buildings, one of which had a stone fence in association. These houses were made of slate and had chinmeys, foundations, and floors. One of these foundations was about 20 feet by 12 feet in dimensions. He also stated that there is a stone slab marker with"Chinese" symbols inscribed on the face. However he was uncertain of the exact location.

He also described a stone slab building beyond the project boundaries and near the main Miller ranch headquarters on Miles Creek.

According to Mr. Miller, these buildings had always been called the Chinese Gold Mining Camps and were reputed to date to the 1850s or 1860s.

Mr. Miller also stated that he had never seen arrowheads on the property and did not know of any collection.

John (Rusty) Brocchini
Oak Road
Mariposa, CA 95339

Interviewed by Ann S. Peak
August 14 & 15, 1981

The American Indian Council of Mariposa County was contacted on or about August 14, 1981, about recommending a Native American observer for Peak & Associates' cultural resources survey for the U.S. Army Corps of Engineers' Merced County Streams project. Mr. Nick Brocchini indicated that his son, John (Rusty) Brocchini was available, and had had experience in archeological investigations. Rusty contact Ann Peak, president of the firm, on August 15, 1981, and he agreed to take the position as the Native American observer. He reported for work on August 17, 1981, and worked until September 3, 1981, when the field survey of the four reservoirs was completed.

Dwight Dutschke
State Historic
Preservation Office
American Coordinator

Interviewed by Jeanne Muñoz
August 19, 1981

Dwight Dutschke does not know any Native Americans in the project area.

Nancy Evans
Native American
Heritage Commission

Interviewed by Jeanne Muñoz
August 19, 1981

There are no Indians listed with the NAHC for Merced, Madera, or Mariposa counties. This does not mean none live there, but that none have expressed any interest in participating in cultural heritage or cultural resource activities.

Allen Beck
Fresno City College

Interviewed by Jeanne Muñoz
August 20, 1981

Allen Beck does not know, or know of, any Native Americans in the project area.

Ed Castillo
University of California,
Santa Cruz

Interviewed by Jeanne Muñoz
August 28, 1981

Ed Castillo has been researching Spanish activity in the general Merced-Mariposa counties during the early 1800s. He states that he cannot say with any certainty that the Merced County Streams project area was definitely Yokuts or definitely Miwok. He states that his data suggest that the Castle Dam area was more likely than not Yokuts, and that Bear and Burns areas were either transitional or Miwok. He states also that the existing ethnographic maps are of no real use, as there is so much disagreement.

Dick Johnson
Fresno Unified School District

Jeanne Muñoz
August-September 1981

Attempts to reach Dick Johnson were unsuccessful.

Charles Ostrander
Merced College

Jeanne Muñoz
August-September 1981

Mr. Ostrander is out of town.

Scott Pinkerton
P.O. Box 71
Mariposa, CA 95338

Interviewed by Melinda Peak
September 29, 1981

Mr. Pinkerton has done considerable research on the western portion of Mariposa County, focussed in the county line. He has done research on the stone house in Merced County which had erroneously been attributed to Fremont. He has gone back to the original survey notes for the Fremont grant and identified the location of a log cabin used by Fremont on lower Mariposa Creek.

He has never been to the Bear Reservoir project area, but has surveyed land immediately south of the project area (for Harry Chase). He knew that there were supposed to be petroglyphs in that area. He had never heard of or seen the upright slab enclosures within the project area. He suggested they might relate to the running of hogs from Mariposa to market at Merced.

By the late 1850s, the laws had changed and there were no Mexican miners left in Mariposa County. Many of the towns which had been predominantly Mexican were ghost towns by 1860. Nearby Toledo is a good example of this. The Chinese came into the Mariposa mining areas primarily in the 1860s and 1870s. They reworked many previously worked areas. Many old towns were totally or partially destroyed because the Chinese worked right up to the structures.

Many of the early structures were low--they have not fallen down. They consisted of half walls, topped by canvas. The canvas came from ships abandoned in San Francisco Bay during the Gold Rush.

The Chinese built their structures with at least one door or window oriented to the rising sun. The Chinese structures can also be identified by digging around for Chinese pottery. Also, a number of wild cat bones may be present as the Chinese ate wild cats for strength.

The Stockton Millerton Road was built along the foothills because of the annual flooding. It was the natural selection for a line when Merced County was divided off.

The book, Sam Ward and the Gold Rush, is the best source for the area.

Mr. Pinkerton believes that there is no one left who has information on the sites in Bear Reservoir. He gave the names of several people who lived or worked in the vicinity. They may have seen the sites but probably have no idea of their origin He believes that, in the reservoir area, because it has been held as a portion of a large ranch for so many years, it will not be possible to learn any more about the structures.

Interview with Scott Pinkerton, continued.

Mr Pinkerton has visited the site of Toledo and said that the sites at Bear sound similar. He believes the ovens may be of Mexican origian as they sound similar to those at Todedo, which was primarily Mexican.

Douglas Richard

Interviewed by Ann S. Peak and
Melinda A. Peak
December 10, 1981

Mr. Richards is the present tenant on the Miller properties in Bear Creek Reservoir. He stated that he did not know of any arrowheads, projectile points, or other artifacts found on the property. He was aware of some of the rock art, but had not found CA-Mrp-606 and several other of the petroglyph loci. He was also unaware of the presence of the prehistoric village sites, although he had seen all of the historic structures.

Marcus Arguelles
2290 W. Lopez Avenue
Merced, CA 95340

Interviewed by Robert Gerry
March 30, 1982

Mr. Arguelles is a Ph.D. candidate in archeology and resides in Merced. As a local resident and an archeologist, it was suggested he be contacted for information on the project areas.

Mr. Arguelles was familiar with the location of the project areas, but had no knowledge of any sites within or near the project area and did not know of any collections of artifacts from there. He recommended Mr. Charles Ostrander of Merced Junior College as the most knowledgeable in Merced area archeology and suggested we contact him.

APPENDIX 3

AUGER TESTING

The auger test holes (AT) were done with either a three-inch auger, or if the soil was too rocky, a shovel was used. The test holes were taken to sterile soils, or as far as the auger or shovel could effectively achieve. Shovel testing becomes difficult below one meter in a hole no wider than the blade. Sterile in this context means cultural deposits are absent, whether a midden development or simply an artifact-bearing deposit. It is admittedly difficult to determine a non-midden cultural deposit, since only artifacts provide the necessary evidence. All soil was shovel broadcast and carefully examined for artifacts. No screening was done. Upon completion of the excavation of the auger holes, they were backfilled.

AUGER LOGS

Burns Reservoir

CA-Mer-52

Test Hole #1

Depth:	60cm, sterile
Soil:	alluvial clay, light yellow
Artifacts:	none
Location:	103 degrees, 44 meters from datum

Test Hole #2

Depth:	80cm, sterile
Soil:	sandy alluvial, dark brown, some recent charcoal
Artifacts:	few fragments of possible fire-cracked rock
Location:	120 degrees, 85 meters from Test Unit #1

Test Hole #3

Depth:	20cm, bedrock
Soil:	clayey loam, light brown
Artifacts:	utilized flakes?
Location:	66 degrees, 100 meters from datum

CA-Mer-76

Test Hole #1

Depth:	30cm, hardpan
Soil:	silty loam, dark brown
Artifacts:	none
Location:	near water trough

CA-Mer-76 (continued)

Test Hole #2

Depth:	40cm, hardpan
Soil:	silty loam, dark brown
Artifacts:	none
Location:	near Locus D

Test Hole #3

Depth:	0-40cm, hardpan
Soil:	silty loam, dark brown
Artifacts:	none
Location:	near Locus B

CA-Mer-79

Test Hole #1

Depth:	0-100cm, not sterile
Soil:	sandy, silty clay loam, dark to medium brown, midden
Artifacts:	fire-cracked rock
Location:	east side of road, near bedrock

Test Hole #2

Depth:	0-60cm, sterile
Soil:	sandy, silty clay loam, medium brown
Artifacts:	none
Location:	east side of road, near cistern

Test Hole #3

Depth:	0-20cm, sterile
Soil:	sandy, silty loam, light brown
Artifacts:	none
Location:	west side of road, near vernal pool

CA-Mer-80

(Only one auger test was done, since the site was obviously only a surface scatter.)

Test Hole #1

Depth:	0-100cm, sterile
Soil:	clayey, silty loam increasing in compactness with depth, light yellow tan
Artifacts:	none
Location:	center of site

CA-Mer-241

Test Hole #1

Depth:	20cm, bedrock (metavolcanic breccia)
Soil:	medium brown clay soil
Artifacts:	none
Location:	90 degrees, 6 meters from Datum A

Test Hole #2

Depth:	25cm, bedrock (metavolcanic breccia)
Soil:	medium brown clayey soil, sterile
Artifacts:	none
Location:	340 degrees, 6 meters from Datum A

Test Hole #3

Depth:	100cm, not to bedrock
Soil:	0-10cm, hard compacted clayey, silty, medium brown; 15-25cm, looser silt, medium brown; 35-45cm, hard pan, compacted clay, light tan, possible midden; 45-100cm, friable, silty loam, dark brown, possible midden
Artifacts:	15 flakes, one core, fire-cracked rock
Location:	356 degrees, 50 meters from Datum A

CA-Mer-244

Test Hole #1

Depth:	50cm, sterile
Soil:	midden, dark grey-brown
Artifacts:	flakes, fire-cracked rock
Location:	in Midden A

Test Hole #2

Depth:	80cm, sterile
Soil:	midden, dark brown
Artifacts:	flakes, fire-cracked rock
Location:	in Midden B

Test Hole #3

Depth:	40cm, sterile
Soil:	midden, as above
Artifacts:	flakes, fire-cracked rock
Location:	in Midden C

CA-Mer-251

Test Hole #1

Depth: 0-30cm, sterile
Soil: silty, clayey loam, medium brown
Artifacts: none
Location: near BRM #1

Test Hole #2

Depth: 0-30cm, sterile
Soil: silty, clayey loam, medium brown, sterile
Artifacts: none
Location: on east bank, 16 meters from the creekbed

Test Hole #3

Depth: 0-30cm, sterile
Soil: silty, clayey loam, light brown, sterile
Artifacts: none
Location: on top of the point to the east to test for midden

CA-Mer-253

Test Hole #1

Depth: 0-20cm, sterile
Soil: light brown silty loam
Artifacts: none
Location: Locus A

Test Hole #2

Depth: 0-20cm, sterile
Soil: light brown silty loam
Artifacts: none
Location: Locus B

Test Hole #3

Depth: 0-100cm, not to sterile
Soil: midden, brown silty loam
Artifacts: possible fire-cracked rock
Location: Locus C

CA-Mrp-596

Test Hole #1

Depth: 0-70cm
Soil: silty, clayey midden, medium to dark brown
Artifacts: fire-cracked rock
Location: near BRM #1

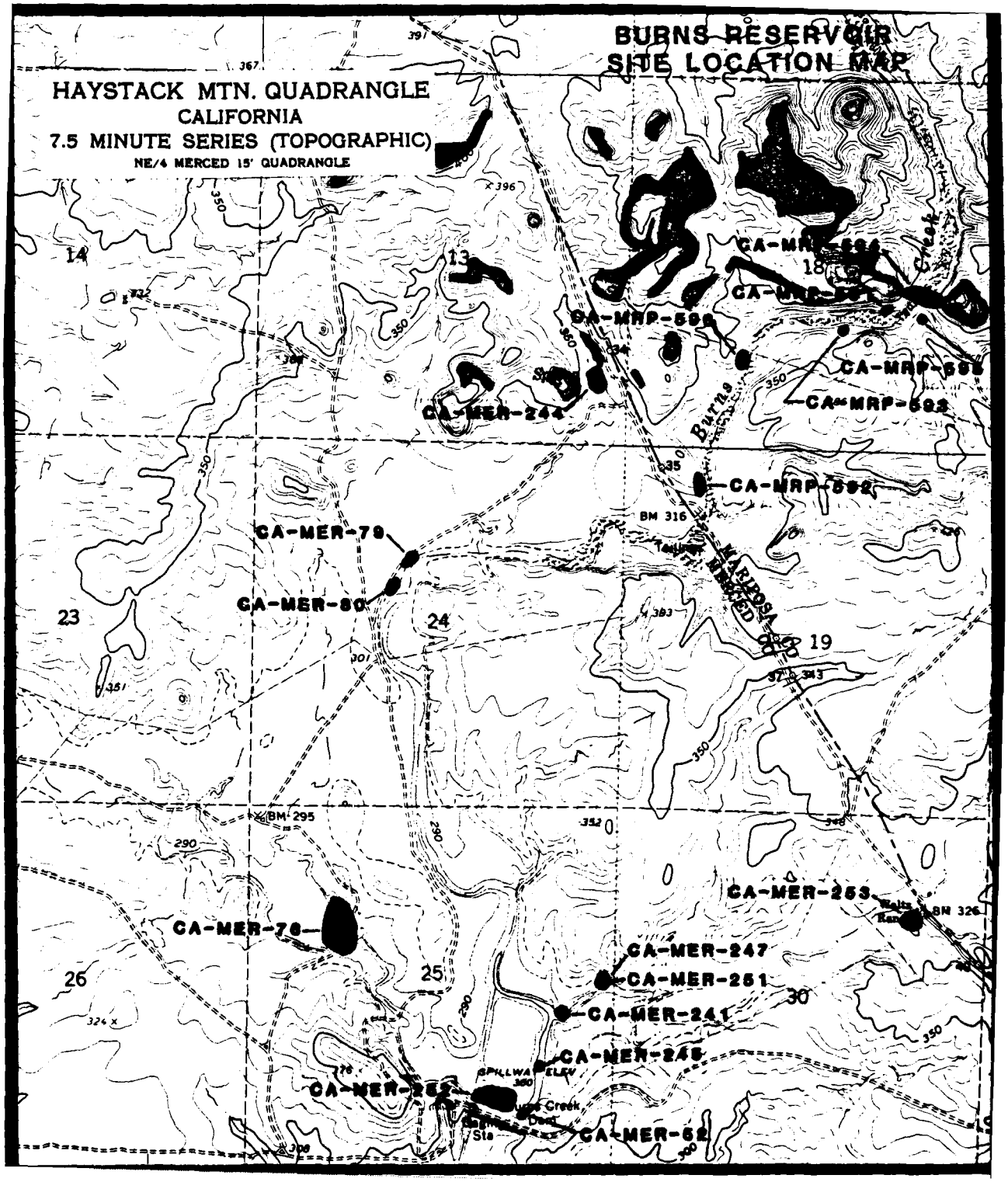
CA-Mrp-596 (continued)

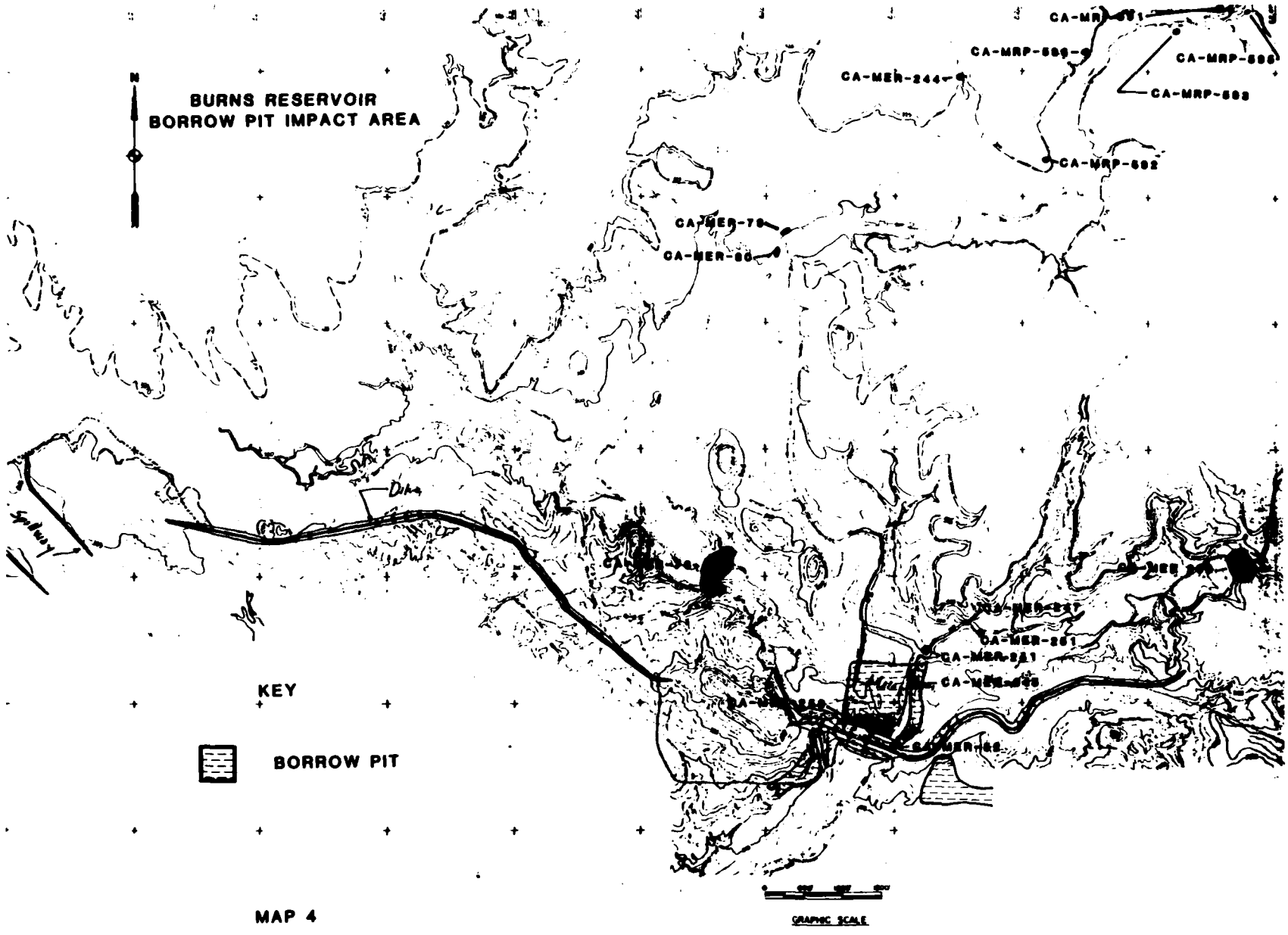
Test Hole #2

Depth:	0-60cm
Soil:	silty, clayey midden, medium to dark brown
Artifacts:	none
Location:	near BRM #2

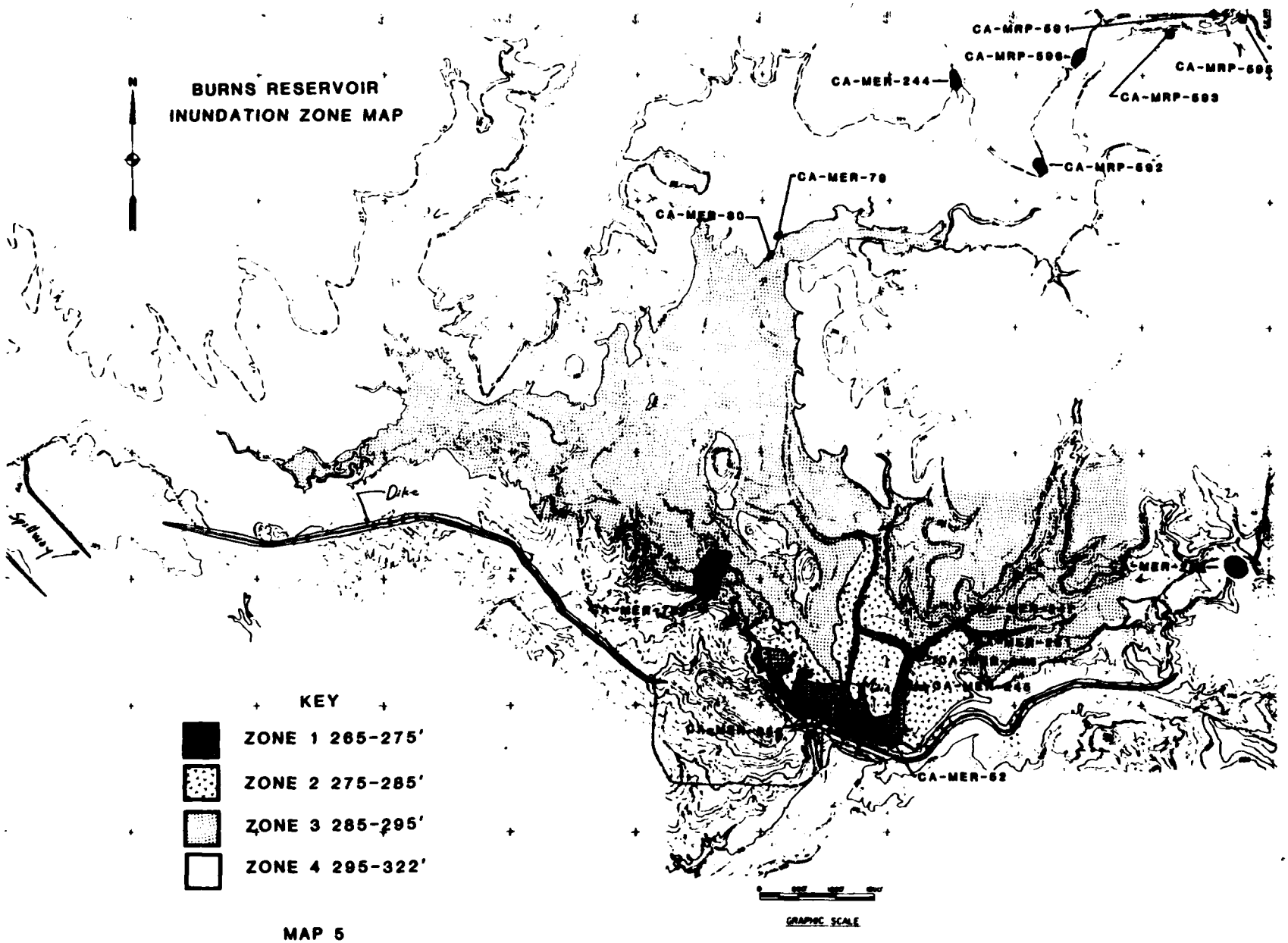
Test Hole #3

Depth:	0-30cm
Soil:	silty loam, light brown, sterile
Artifacts	none
Location:	on slope between BRM #2 and BRM #3


BURNS RESERVOIR
SITE LOCATION MAP
HAYSTACK MTN. QUADRANGLE
CALIFORNIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE/4 MERCED 15' QUADRANGLE
CA-MRP-594
CA-MRP-595
CA-MRP-596
CA-MRP-597
CA-MRP-598
CA-MER-244
CA-MRP-592
CA-MER-79
CA-MER-80
CA-MER-78
CA-MER-253
CA-MER-247
CA-MER-251
CA-MER-241
CA-MER-245
CA-MER-252
CA-MER-62
BM 316
BM 295
BM 326
Burns Creek
MARIPOSA
Dam Site
SPILLWAY ELEV 360
13
14
18
19
23
24
25
26
30


N
BURNS RESERVOIR
BORROW PIT IMPACT AREA
CA-MRP-592
CA-MER-79
CA-MER-80
Dike
Spillway
KEY
BORROW PIT
GRAPHIC SCALE

MAP 4


BURNS RESERVOIR
INUNDATION ZONE MAP
N
CA-MRP-591
CA-MRP-590
CA-MRP-595
CA-MRP-593
CA-MER-244
CA-MRP-592
CA-MER-78
CA-MER-80
Dike
Spillway
CA-MER-52
KEY
ZONE 1 265-275'
ZONE 2 275-285'
ZONE 3 285-295'
ZONE 4 295-322'
GRAPHIC SCALE

MAP 5